PETROLEUM WEEK

OCTOBER 11, 1957

■ A McGRAW-HILL PUBLICATION

OIC may merge with APIC . . 15

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PETROLEUM WEEK Special Report:
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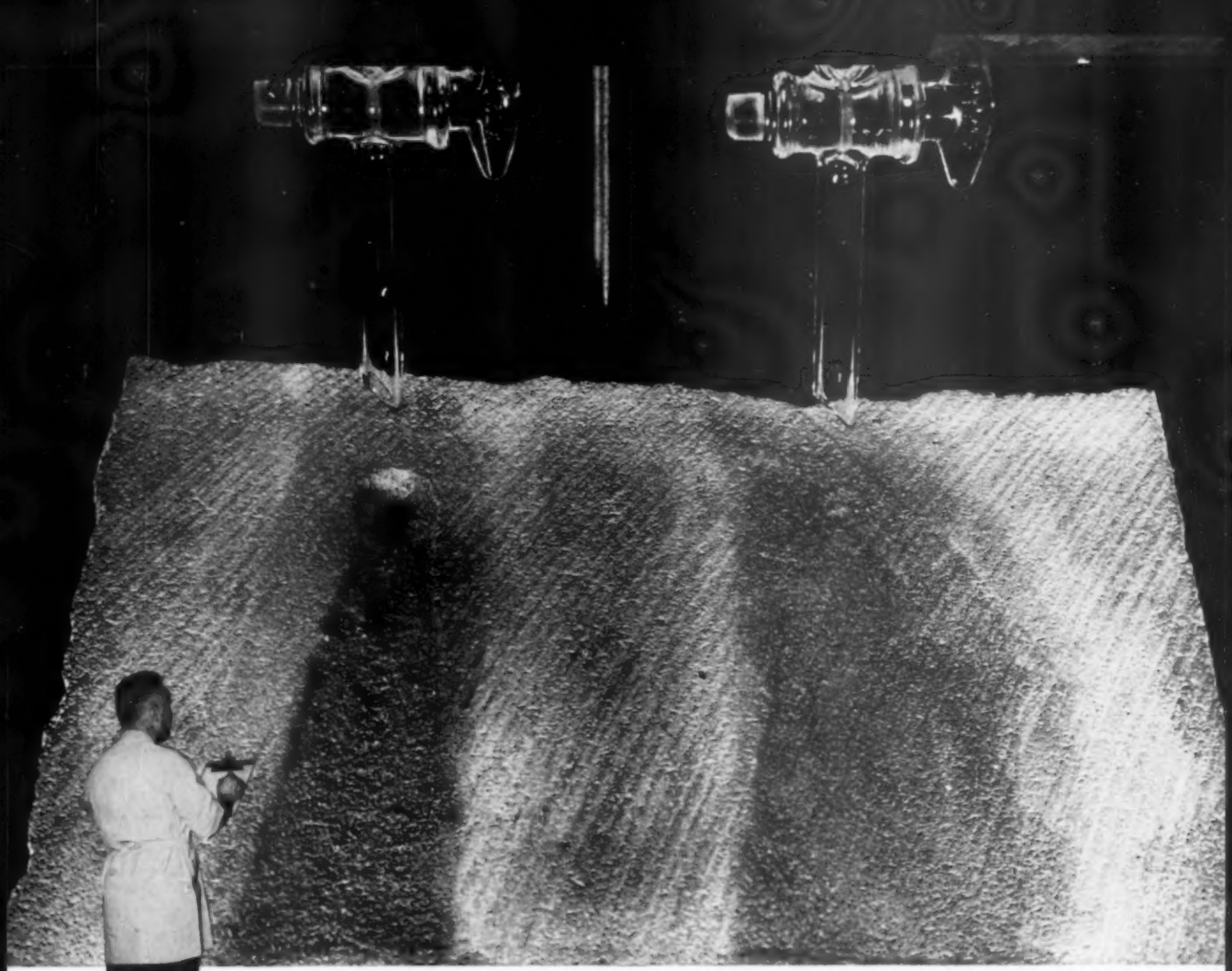
Price 50 Cents



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Certain formations, notably fast-reacting fractured or vugular limestones, respond better to a retarded acid than to either regular acid or fracturing treatments.

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Services for the oil industry

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It takes you to market, to work, to school, to any place you have to go. That's a help.
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One of these weekends, just get in your car, and get out on the road, and ride. And relax. And look around a little bit.
And when you see something you like, stop for a closer look. At a country museum, maybe. Or a clear cool picnic pond, where you can skip a few flat stones with your kids, and eat. They'd like that. You probably would, too, wouldn't you?
How about this weekend?
There are over 200,000 service station men ready to help you wherever you drive. Knowing that trained, experienced help is as near as the next service station makes motoring a carefree pleasure.
DRIVE MORE—IT'S FUN FOR THE WHOLE FAMILY
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ETHYL CORPORATION
New York 17, New York

ETHYL CONTINUES LONG-RANGE MARKET EXPANSION PROGRAM—

1957 Series again aimed at putting more mileage on the nation's cars—and increasing service station sales

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Each ad also reminds the motorist of the important role America's service station men play in making driving a pleasure.

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EVER-TITE ADAPTER AND COUPLER

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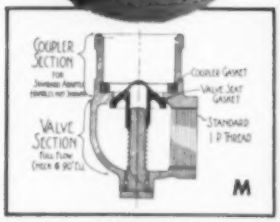

EVER-TITE COUPLING ELBOW AND CHECK VALVE UNIT

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Superior quality forged body —precision machined
Uniform wall thickness —no weak spots
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Extra Hi-Strength forged handles —greater economy
Stainless Steel pins —greater safety and longer service
Uniform heavy wall thickness —no weak spots
Recess retains gasket in coupler and assures proper placement
Superior quality forged body —precision machined —accurate tolerances

You save time in deliveries — and reduce wear and maintenance costs—when you use Ever-Tite Couplings. Ever-Tite gives you the finest in *quality* and *engineering*. And Ever-Tite gives you *tight* connections every time—because every Ever-Tite has positive gasket compression that is dependable under *all* conditions. Get Ever-Tites—and get the best in quick couplings. There is an Ever-Tite for every need. Ask your distributor.

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97 Locking Cap

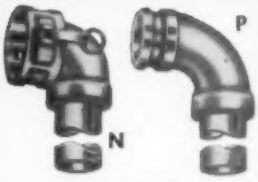
97 Twisting Cap

97 Adapter

No. 97 Ever-Tite Fill Cap

97 Adapters for Ever-Tite "99" Coupler

EVER-TITE ADAPTER AND COUPLER FOR TANK CAR UNLOADING



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EVER-TITE SPOOL ADAPTER

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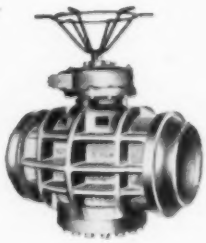
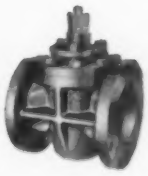
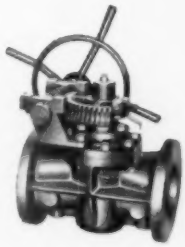
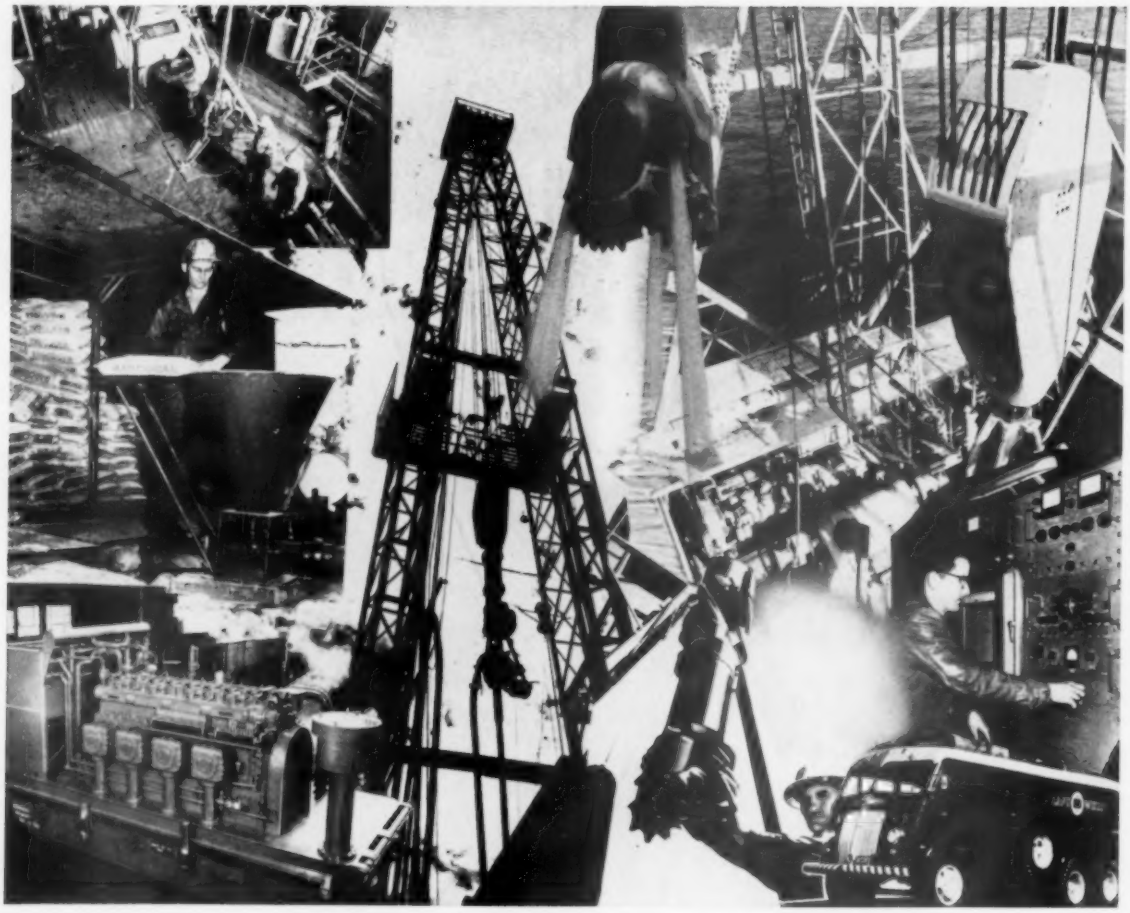






ROCKWELL-Nordstrom VALVES

Lubricant Sealed For Positive Shut-Off



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SECURITY ENGINEERING DIVISION, Dallas, Tex., Whittier, Calif.—Rock bits, reamer rock bits and hole openers; reamers, casing scrapers and Neo-Red rubber stabilizers.

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86 YEARS OF PROGRESS WITH THE OIL INDUSTRY

60-Second Summary / WHAT'S HAPPENING IN OIL

AT-A-GLANCE PETROLEUM WEEK Copyright

October 11, 1957

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API is thinking of merging the American Petroleum Industries Committee and the Oil Information Committee. Under the plan, which may be considered next month in Chicago, APIC would take over spot industrywide public relations problems. . . . p. 15

•

Drilling contractors are generally optimistic that new tools and techniques will improve their long-range outlook. The aim is to get hole down faster, better, and cheaper. Some of the hopes stem from new reports on turbodrills. . . . p. 43

•

A newly formed American firm may finance a $500-million pipeline from Iran to a port in Turkey. The Iranian Parliament will be asked to authorize National Iranian Oil Co. to sign an agreement with the firm, which includes Allen & Co., a New York investment house. There are still many obstacles. . . . p. 82

•

The Justice Dept. is satisfied with state conservation practices, but questions some company policies. In an annual report, Attorney General Herbert Brownell "clears" the Interstate Oil Compact Commission and state regulatory groups, but hits at purchaser proration and control of pipelines by big oil firms. . . . p. 15

•

Loffland Bros. Co., the world's largest drilling contractor, now has 29 rigs running in Latin America, with most of the activity centered in Venezuela. . . . p. 80

•

British Columbia's Fraser Valley is becoming an exploration focal point in the Pacific Northwest. Though previous tests failed, a new wildcat is being watched closely. . . . p. 25

•

Tomorrow's marketing equipment and sales techniques are being tested in a "research" service station. It's the core of a new research program by Magnolia Petroleum Co. . . . p. 86

•

Some Du Pont plants are chalking up 20% savings on maintenance with an "engineered" assault on repair bills. The program couples preventive maintenance with careful controls over budget, manpower, plant shutdowns, and materials. . . . p. 74

•

Two California drilling contractors are going out of business. In each case, the reason was a simple one: Lack of adequate return on investment. . . . p. 20

•

Oil's growing use of radio may bump into a ceiling. The Federal Communications Commission has proposed rule changes which industry men feel would be harmful. . . . p. 18

Up to the Minute / SIGNIFICANT LATE NEWS

AT-A-GLANCE PETROLEUM WEEK Copyright

October 11, 1957

Oil firms are often accused of starting price wars, or of not preventing them. Now 14 firms are charged with stopping one. A federal grand jury in South Bend, Ind., this week indicted the 14 on charges of fixing retail gasoline prices. This stemmed from the sudden ending of a month-long price war there last May. The defendants range from major companies, such as Indiana Standard, Gulf, Texaco, and Socony Mobil, to such small ones as Tornado Oil.

•

Plans of Commerce Oil Refining Corp. to build a refinery at Jamestown, R. I., have struck another snag. The Office of Defense Mobilization has refused to renew a rapid tax writeoff certificate on grounds that the project might conflict with adjoining naval installations. The refinery already has been under fire from residents of nearby beach areas.

•

Deep well derby (continued): Record depth drilling in Texas reached 21,149 ft. this week at Pan American's No. 1-CS University in Pecos County. The world's record is 22,570 ft. Meanwhile, there was a new entry in the depth "race." A 24,000-ft. wildcat is being started in Caddo County, Okla., by Howell, Holloway & Howell, Gulf, Tek-Oil, and Kenneth Ellison & Associates. It is 28 mi. northwest of Oklahoma's current champ, Magnolia's No. 1 Sterba (20,426 ft.).

•

An effort may be made to "scuttle" flag-of-convenience fleets, such as those of Panama, Liberia, Costa Rica, and others. A Britisher, Viscount Simon, has proposed formation of a "club" of maritime nations. This "club" would not allow ships built or owned in a member country to be registered in or sold in any country outside the "club." The plan might run afoul of U.S. antitrust laws.

•

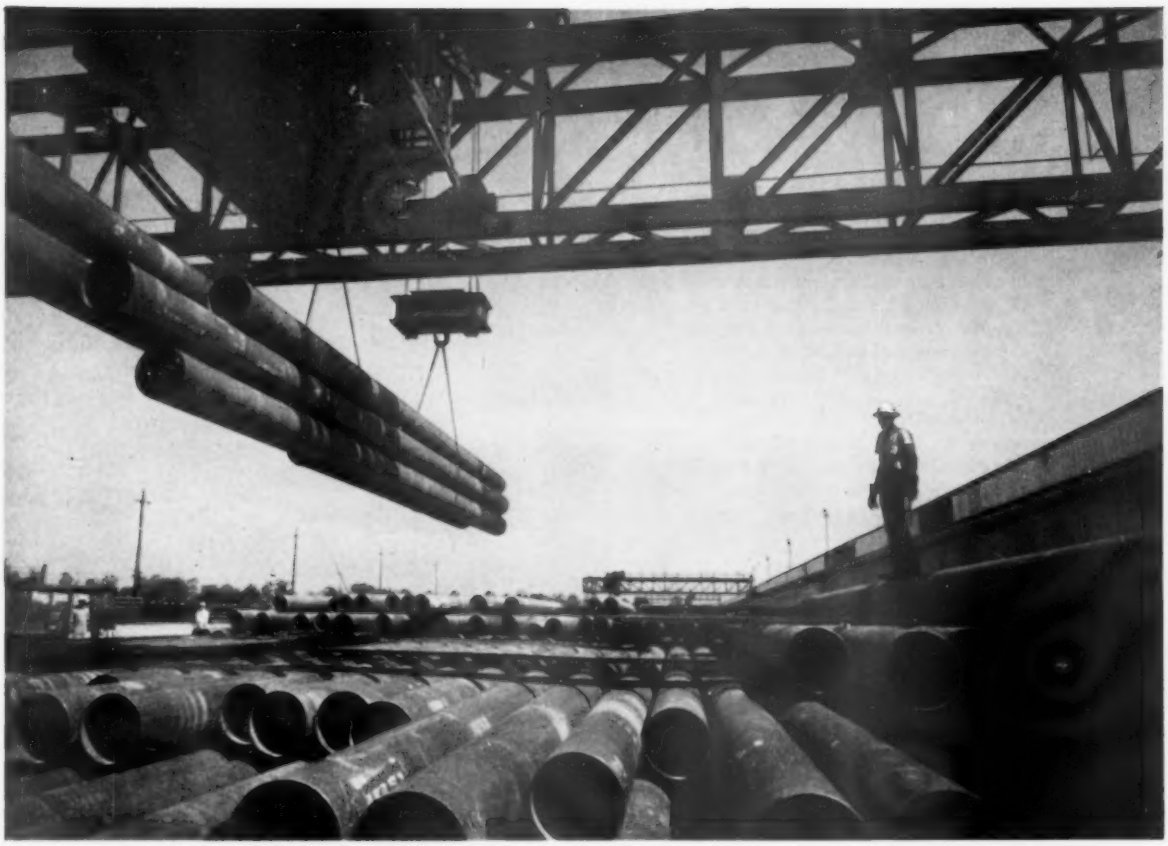
The 10¢-a-bbl. downward adjustment in some Arkansas crudes appears localized and not apt to spread. The change, initiated by Indiana Oil Purchasing and followed by Arkansas Fuel Oil and Sohio Petroleum, was designed to bring those prices in line with competitive crudes.

•

Canadian natural gas began flowing into the Pacific Northwest this week. A valve was turned that sent gas from the Peace River region of British Columbia through Westcoast Transmission's line into the Pacific Northwest Pipeline Corp.'s system.

•

Texas Eastern has hit back at those seeking to block conversion of the Little Inch to products transmission. It filed a $32-million antitrust suit this week, charging nine barge operators, three oil firms, and an individual with "conspiring" to monopolize transportation from the Texas-Louisiana-Arkansas refining area to Midwest markets. The result, Texas Eastern says, has been to delay its conversion of the pipeline.



Joe Roughneck's solid source of supply...

Wheel of plenty! Welding pipe by electric resistance weld process. Lone Star API pipe is fully normalized.

API CASING | API TUBING | API LINE PIPE

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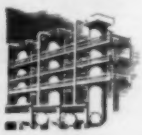
In the frozen north... Canada's first "BIG INCH"

WESTCOAST TRANSMISSION COMPANY is laying a 30 inch pipeline to tap the prolific gas resources of British Columbia and Alberta. This line runs from these fields due south to the international border. The 688-mile main line marks the first large-scale interchange of natural gas between western Canada's new and expanding fields and U. S. markets. A .O. Smith's Milwaukee mill supplied approximately 22% of the 30-in. pipe used on the project.

Northwest passage... new mileage for world's longest "crude line"

INTERPROVINCIAL PIPE LINE COMPANY has 1774 miles of main line now in service. They are extending this system another 156 miles during 1957. This big crude oil carrier extends from Edmonton, Alberta, to refineries in the Prairie Provinces and Ontario, in Minnesota, Wisconsin, and Michigan. Over 70% of the original line to Superior, Wisconsin, was supplied by A. O. Smith as well as most of the pipe for current and subsequent looping projects.

Want more facts about A. O. Smith products for the petroleum industry? Write today for free, illustrated brochure, "OIL"



Pressure vessels, heat exchangers

Glascote processing equipment

Gasoline dispensers, liquid meters

In the
a river

To cross
NATURA
river . .
The new
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Arizona,
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Welding
electrodes o

Today, as always . . .

there's A. O. Smith line pipe in major pipelines like these

Just about 30 years ago, A. O. Smith researchers developed the first truly practical method of mass-producing line pipe. *Result:* Pipelines, as we know them today, became economically feasible.

And A. O. Smith has kept the pace — with painstaking attention to quality in every production phase. This is the reason why A. O. Smith pipe, made and installed as far back as 1928, is still in operation today. This is the reason why you'll find A. O. Smith pipe in so many major high-pressure lines (including the four current projects pictured and described on these pages).

In the arid southwest... a river is pushed aside

To cross New Mexico's San Juan river, **EL PASO NATURAL GAS COMPANY** temporarily diverted the river . . . used dry-land pipelining methods. The new line will supply an additional 350,000,000 cubic feet daily to customers in California and 100,000,000 cubic feet more daily to customers in Arizona, New Mexico, Texas and Nevada. A. O. Smith Corporation of Texas mill supplied approximately 224 miles of 34-in. pipe for the project.

Underwater project... "MUSKRAT LINE" submarines toward completion

TENNESSEE GAS TRANSMISSION COMPANY'S 355-mile pipeline extension is laid underwater four-fifths of its length — traversing swamps and marshland. It will give the Tennessee gas system more than 9500 miles of line in 15 states, with average daily capacity of 1,800,000,000 cu. ft. A. O. Smith supplied the 18 and 20-inch pipe and a portion of the 24-in. pipe for the new extension.

Welding machines, electrodes and accessories

Line pipe, oil well casing

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International Division: Milwaukee 1, Wisconsin

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DALLAS 2
HOUSTON 2
LOS ANGELES 17
MIDLAND 5, TEXAS
NEW ORLEANS 12
NEW YORK 17
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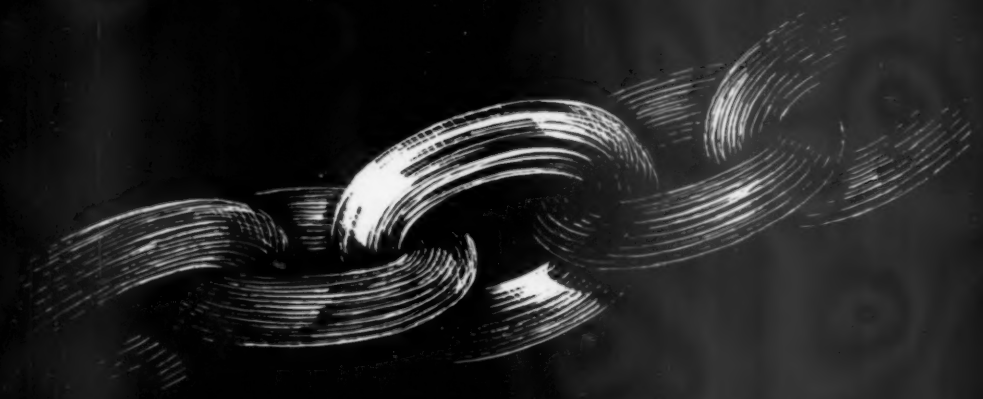

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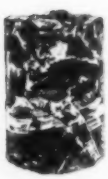

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Brownell O. K.'s IOCC; Hits 'Big Oil'

Attorney General Herbert Brownell gives a clean bill to the Interstate Oil Compact Commission and state conservation practices. But he promises to look further into the "disparity of economic power" between the big companies and independent producers.

Brownell last week submitted his second annual report to Congress on IOCC.

In extending authority for the compact in 1955, the lawmakers adopted a rider requiring the Justice Dept. to report annually on "whether the activities of the states under the provisions of such compact have been consistent with Article V of the compact."

Article V states that the compact shall not be used to limit production, to stabilize or fix prices, or to create or perpetuate a monopoly.

Noting that the states were acting to conserve oil and gas long before the compact came into being, Brownell assumes Congress actually wants an inquiry "into all facets of the possible utilization of the conservation system for the purposes of monopolization or price stabilization."

Brownell finds that IOCC has never tried to control or dictate the conservation policies of its member states. He also finds that industry members of commission committees do not exercise undue influence.

"On the whole, the activity of the commission appears to have been worthwhile," says the Attorney General. "Above all, the compact and its commission are unique examples of effective interstate cooperation on a wholly voluntary basis."

The Justice Dept. suggests that state market-demand laws have less to do with actual production levels than do the policies of petroleum purchasers that operate in several states.

Brownell refutes charges by critics who claim the Bureau of Mines monthly forecasts are used by state regulatory bodies in such a way as to constitute state production quotas.

Brownell also scoffs at charges that the Bureau of Mines forecasts are unduly influenced by data submitted by the American Petroleum Institute or other trade associations.

However, the Attorney General serves fair warning that he plans closer scrutiny of the posted price system for crude oil, and of the big importers' disproportionate control over oil transportation facilities in the U.S. He says the relative decline in markets for domestic oil, as reflected in lower allowables, "has serious implications in regard to the competitive status of the industry."

Brownell observes that integrated purchasers "may restrict their buying from independent producers while maintaining production from their own domestic or foreign wells or fields."

"Purchaser prorationing," he con-

API May Merge APIC and OIC

A tentative proposal for merging the American Petroleum Industries Committee with the Oil Information Committee has been drafted. It will come up for consideration at the API annual meeting next month in Chicago.

Under the proposal, APIC would be expanded to take over the responsibility for handling immediate industrywide public relations problems.

The immediate public relations problems have been the main function of the Oil Information Committee. But the proposed plan would assign to OIC the responsibility of certain long-range public relations campaigns.

OIC activities at the field level, which are handled by several district offices, would be dove-tailed into APIC work. Such a move, according to one source, would give APIC "the benefit of trained workers, which the APIC state organizations now lack."

APIC is headed by an industry chairman, William F. Kenney, vice-president and general counsel of Shell Oil Co. John H. Bivins is the director of the organization, in New York.

There is a committee of industry representatives in each state, headed by a chairman. An executive secretary in each of the state organizations is employed by the state committee.

The primary work of APIC is in the field of legislation, particularly tax legislation, affecting the oil industry at the national and state levels.

The proposed Washington office for both legislative and publicity work, headed by an "industry spokesman," would be retained under the plan (PW—Nov.9'56, p10).

The Washington office item is already in the API budget and will stay in it.

But API still faces the big difficulty of finding someone of the right stature to handle the job—a person who could effectively represent all of the branches of the industry.

The reorganization would reflect a "major change" in industry thinking, some feel. There is no assurance that it will be adopted.

A few years ago, in fact, a proposal to put APIC under the Oil Information Committee was defeated.

The new proposal is a rather "radical departure in industry thinking," one industry representative said. "If I were betting on it," he added, "I would wager that it isn't accepted."

The proposal would require changing some API committees. It would probably mean that the present public relations committee of the API executive committee would take on some governmental relations duties.

There would also be a coordinating committee established to make sure the gears mesh smoothly between APIC and OIC.

As far as can be learned, the proposal was not considered by the API executive committee at its recent Ft. Worth meeting. Instead, it was reportedly put off until the Chicago meeting.

cludes, "indicates an undesirable degree of control over the particular field markets for crude."

The Attorney General also presents data showing that 87% of the pipeline capacity between West Texas and the Gulf is held by companies that import into the East Coast.

Thus, he notes, a large part of the market for West Texas oil hinges on imports policies of the East Coast refiners.

The original draft of the report may not have contained the attacks on the big integrated oil purchasers.

There were rumors in Washington that an independent producer association helped sell the department on rewriting the report to reflect antitrust fears concerning big company control of the industry's transportation facilities.

It is not clear whether the Justice Dept. actually plans new oil inquiries —possibly involving grand jury action —or whether it is mostly trying to head off congressional criticism.

The House antimonopoly subcommittee open hearings later this month into whether the Justice Dept. has enforced its 1941 decree limiting oil company dividends from pipeline operations.

And Sen. Joseph C. O'Mahoney (D., Wyo.) is said to be pushing for an inquiry by the Senate antitrust subcommittee into antitrust aspects of major company pipeline operations.

Brownell dropped a hint in his report that crude pricing practices could be considered by the federal grand jury already sitting in Alexandria, Va.

At any rate, he vows to explore oil antitrust problems further.

UOP Sale a Step Closer

- **Guaranty Trust Co. and independent refiners have about reached agreement on plan to assure refiners of continued UOP service if stock is sold.**
- **But there's still a long road to hoe before the independent research organization can offer shares to the public. And there are still obstacles.**

Universal Oil Products Co. may one day offer its stock for public sale, but this week that day still seems far distant.

There's been considerable controversy ever since it was made known last year that a petition had been filed seeking to sell the stock of UOP—a leading independent research organization, which has pioneered in the development of many refining processes (PW—Jun.29'57,p12).

Here are the principals in the knotty problem:

- Guaranty Trust Co., trustee for the American Chemical Society's Petroleum Research Fund, in which UOP ownership is vested.
- The New York state attorney general, an indispensible party;
- Independent refiners;
- The New York state supreme court.

One of the major hurdles to the stock sale—objections of independent refiners—is about to be cleared.

Last week, PETROLEUM WEEK learned from a source in the middle of the dispute that agreement on one major issue—the mechanics of the stock sale —is near, perhaps less than a week away. This agreement would be between representatives of Guaranty and the independent refiners who have "intervened" in the case.

Independent refiners have been pressing for sales terms that would insure a wide distribution of UOP stock. That's because they feel it is imperative for them that UOP's research and development continue to be made available to all refiners.

Certain independent refiners, as well as the Independent Refiners' Assn. of America, have held that purchase of UOP by one or several large oil companies would threaten the independents with "the grave danger of losing the only substantial independent source of technology presently available to them."

These smaller refiners are generally not in a financial position to carry on their own large-scale processing research. And although the research affiliates of major companies generally offer their process developments for licensing, most smaller refiners prefer to have available an independent research, process licensing, and engineering firm. UOP has been filling this need.

"Without such necessary processes freely available on a nondiscriminatory basis," says IRAA, "independents may as well close up their plants or face the prospect of involuntary demise."

On this basis, IRAA entered the stock sale case as an "intervenor"—primarily to make sure that eventual UOP public ownership was really public.

The independents' objections are now being met.

Late this spring, the court asked a "referee"—an impartial lawyer—to examine and report on an "intermediate agreement" between Guaranty and the intervenors, which specified terms of sale acceptable to both factions.

The referee, Louis Loeb, in his report, recommended that the proposed procedure not be followed. He contended that it would have committed the court to "specific terms of sale if

Alcorn: 'A Tough Year Ahead for Oil'

Charles W. Alcorn, the new president of the Texas Mid-Continent Oil & Gas Assn., thinks the industry is going to be in for a rugged year, politically.

He is optimistic, however, that the various segments of the industry will work together toward a solution to key problems.

Alcorn, who rose from roustabout to independent operator in 38 years, points out that the industry has been "homogeneous from the beginning, with independents and majors interdependent."

"Independents are going to have to pull in their belts a little, and some are going to get hurt," he said. "But that's free enterprise."

Alcorn, elected last week by the association, succeeds French Robertson, Abilene independent producer, who had held the post for two years.

and when authority to sell is granted at some future date," and that there was "nothing before the court at the present time to establish that such terms were in all respects the most appropriate to serve the public interest best."

However, Loeb's report pointed to a way out of the dilemma: "The same end can be achieved by having the petitioner [Guaranty] amend its petition to ask for authority to sell on these specific terms. The intervenors can then withdraw . . ."

The PETROLEUM WEEK source said last week that the "details of a new agreement built on the referee's recommendations are expected to be ironed out within a week."

It is assumed that the new agreement would get the support of the referee. Such support would probably mean that the court would agree to the terms of sale. These steps are now called "reasonably certain." It is possible, however, that the court may not go along with the referee's decision. In either event, it will probably be several months before the court decides on this point.

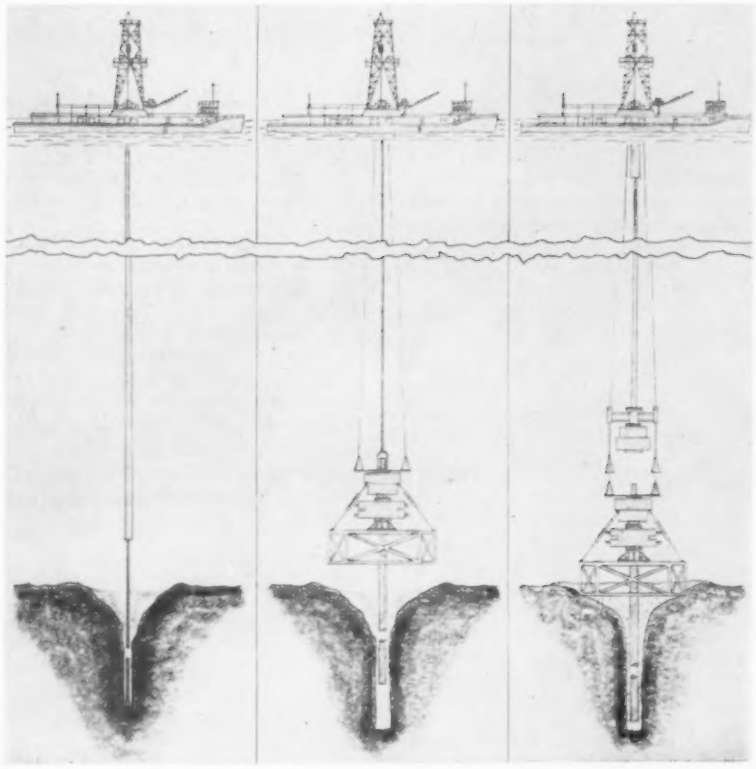
Representatives of Guaranty and the independent refiners have agreed that (1) each investor in UOP stock will be allowed to buy no more than 2% of voting securities; (2) prior to the stock sale, Guaranty will name a designated individual to the UOP board of directors for a three-year term; and (3) also prior to the stock sale, Guaranty will approve contracts between UOP and each of the independent refiners involved. These contracts will specify that UOP, for a specified period of time, will continue the type of service it has previously offered independents.

Other issues remaining to be settled include the proposed fees to be charged against the sale of the UOP stock.

The N. Y. State Attorney General's office told PETROLEUM WEEK last week that, notwithstanding that office's objection, there is no indication that Guaranty has changed its position with respect to the proposed fee.

Referee Loeb, still working on the matter, has so far been unable to schedule hearings. There's just no way of telling how long such hearings will drag on, once they're under way.

Public sale of the stock would enable UOP's trust-fund ownership to seek larger and more stable income for advanced research in the petroleum field. It's been Guaranty's contention all along that such diversification is now necessary to carry out effectively the research projects for which the fund was created.



For Sale: Unique Deep Sea Drilling Ship

The CUSS group, which received a patent last week for a unique deep-sea drilling technique, has put its drilling vessel and a sister ship up for sale. After developing a system that makes drilling possible in water depths of 1,000 ft. and more, the group (Continental, Union, Shell, and Superior) backed down on its offshore plans when California boosted offshore royalties (PW—Jun.21'57,p21).

Here's how the technique works: Hole is spudded (left) using salt water for circulation. Surface casing, upon which is flanged the casing head and two conventional blowout preventers, is lowered into place (center). The assembly mounts two guide cones, connected by cables to the vessel. After cementing, packoff assembly is lowered over the guide cones (right) preparatory to running the drill bit.

Pump-Makers' Problem: New Gasolines

Gasoline pump manufacturers are considering a program to combat the "incompatibility" of pump parts and some new gasolines. The problem is still in the "annoyance" stage, according to members of the Gasoline Pump Manufacturers Assn. who met last week at Pebble Beach, Calif. But most agree something should be done.

The problem: The increased use of aromatics and additives in gasolines is sometimes causing swelling, shrinkage, or deterioration of pump parts made from plastics, elastimers, leather, and to some extent, metal. Among the parts affected are gaskets, rotary seals, and cup washers for pistons (traditionally leather).

The association's managing director, Theon Wright, and its technical director, R. L. Demmerle, see a solution to the problem going by default. They blame a lack of coordination among the oil companies, pump manufacturers, and parts and materials suppliers. Last week they proposed a "technical coordination program," which is being considered by the pump association's executive committee.

This program has two parts. The first is the development of standardized test methods. This would include the use of a reference fuel—one that would create all the worst effects—for testing pump materials.

Second part of the program would be improvement of communications—including liaison with technical subcommittees of the American Petroleum Institute, the American Society for Testing Materials, and the Society of Automotive Engineers.

Oil Industry's Use of Radio Would Be Res

Petroleum service and supply companies would be hardest hit under changes in industrial radio rules that the Federal Communications Commission is proposing.

About 275 supply companies, large and small, have a $9-million investment in fixed stations and in 8,244 mobile transmitters. They are using frequencies which, their spokesmen say, would be subjected to new crowding and downgrading—both as to power and quality—under the proposed new rules.

Last week industry's legal representatives filed three petitions of protest with FCC, hoping to block the new rules.

The petitions were filed by the Petroleum Equipment Suppliers Assn. (PESA), the American Petroleum Institute, and the Special Industrial Radio Service Assn. (SIRSA).

They point out that the oil industry needs more high-quality, protected radio frequencies for its exclusive use. FCC is proposing, instead, fewer frequencies, of lower quality, to be shared with diverse other business and industrial interests.

The big issue is in what FCC prosaically calls "Amendment of Part 11, rules governing the industrial radio services, to delete, modify, and create [new] services, and to effect changes in the availability of frequencies."

What that means to the petroleum and related industries, when you break through the legal phraseology, is this:

FCC proposes to abolish the industrial radio service, a special class of high-quality frequencies under which high-priority industrial users are now licensed.

Among the principal users of the IRS are petroleum's suppliers and specialized service companies—Halliburton Oil Well Cementing Co., Hughes Tool Co., Schlumberger Well Surveying Corp., Lane-Wells Co., and Dowell, Inc., to mention but a few.

In place of the industrial radio service, FCC would set up what it calls a new business radio service. This would absorb also the low-quality frequency allocations now held by the low-power industrial service and by the citizens' radio service.

The new business radio service would be expected to accommodate present industrial radio service users —plus whatever newcomers FCC chose to license under relaxed eligibility regulations. That, by FCC's own words, would include "almost anyone engaged in any lawful business activity."

To take care of another new classification, the manufacturers' radio service, FCC proposes to commence a limited sharing of frequencies now allocated to the petroleum radio service and the forest radio service.

The petroleum radio service is the long-established category that most oil industry radio users—as distinguished from their supply and service companies—have been using.

At this point, the FCC proposals are just that—proposals. But they do indicate how the commission is thinking, tentatively, at least.

Now, with the comments on file, FCC must decide what its next move will be. It could, without even putting the matter to a hearing, go ahead and adopt the proposed rules. Or it could, for that matter, revoke the proposals and leave the situation as is.

Likeliest bet is that neither of those courses will be followed. Instead, FCC probably will now call for hearings.

The industry's petitions of protest concentrate their heaviest fire on the proposal to abolish the industrial radio service.

PESA, in a legal brief that runs to more than 100 mimeographed pages, charges:

"Although all the new vast numbers of eligible persons in the business radio service may apply for any frequency available in that service, it is not proposed to make any additional allocations in the 25-50-megacycle band, where the majority of the industrial radio service operations are concentrated, and where virtually all petroleum service and supply companies that use radio operate and must continue to operate to meet their long-range communications requirements.

"And it is in this very band that the majority of the newcomers may be expected to apply. This failure to propose additional frequencies in the 25-50-mc. band, while at the same time opening the availability of these frequencies to a host of new applicants, is the Achilles heel of the commission's proposal."

PESA's petition recalls that FCC refused, only two years ago, to relax eligibility regulations in the industrial radio service because frequencies in the 25-50-mc. band were inadequate. The same fact, PESA maintains, is true today, and, therefore, the proposal "is jeopardizing many millions of dollars invested in equipment by all industrial radio service licensees."

Narrowing that figure down to petroleum service and supply firms, the association brief notes the $9-million radio investment by member companies that operate 8,244 mobile

Radio Helps Oil Meet Emergencies...

The use of radio, particularly by service companies in the field, frequency is invaluable. For instance:

An offshore well, off Natchez, Miss., showed remarkable, and unexpected, high pressures during perforation, ruining all sets of lubricator glands available at the site. A radio call and an airplane delivery put additional parts on the drilling platform within two hours.

The saving: At least 19 hours of rig time. And a possible serious well blowout was prevented.

This was one of numerous examples cited to FCC in the industry's presentation of its case for adequate radio channels.

Be Restricted by FCC's Proposed Rules

transmitters. Six big companies alone operate 3,454 mobile units and have a combined radio investment of about $3.8-million, estimated as follows:

Halliburton Oil Well Cementing Co., $1,450,000; Dowell Inc., $650,000; Lane-Wells Co., $620,000; Radio Schlumberger, Inc., $600,000; B. J. Service, Inc., $275,000; and Mid-Continent Supply Co., $175,000.

As the industrial radio service is constituted today, there are, altogether, some 13,600 stations assigned. Of these, 9,615 are in the 25-50-mc. band, which is now reserved exclusively for the service; 2,592 are in the 152-162-mc. band, which the service shares with others; and 43 share 450-460-mc. band.

The most desirable frequencies, from a technical viewpoint, are those in the lower frequencies, which are known as "very high frequency" (VHF). They have considerably longer range than the 450-460-mc. frequencies, which are known as "ultra high frequency" (UHF). Another reason for their greater desirability is that VHF equipment is 20 to 25% cheaper than UHF equipment.

Industry's use of radio has undergone tremendous growth in recent years. Over-all, there has been a 1,200% increase in the industrial radio service. As for petroleum-supporting industries, the six companies named above—Halliburton, Schlumberger, et al—have themselves seen almost a 1,500% increase. In 1951, they had a combined total of 262 transmitters; now six years later, they have 3,454.

PESA says the dangers in FCC's plan are future as well as present—not only threatening existing investment, but also posing a hazard to potential future growth.

The association says that industrial radio growth in the oil-supporting conglomerate can reasonably be expected to show another 1,500% increase in the next seven years. "Radio will become a necessity for every petroleum service and supply company, however large or small," the brief says, adding:

"In fact, the very small company, operating a limited number of vehicles, will probably find radio more necessary than others, because of the need for employing its limited number of vehicles with the highest degree of efficiency and the least 'downtime' . . ."

Going to the counter-attack, PESA proposes, instead of a dilution of the industrial radio service, the creation of a new special service in which petroleum supply and service companies of the 17 "oil states" would be given vested and exclusive rights.

The association says preliminary studies indicate that petroleum-supporting firms in these states could saturate a minimum of 30 frequencies in the 25-50-megacycle band. And, "the frequencies could be shared with other users having long-range communication requirements in the remaining states of the Union."

In less detail, the Special Industrial Radio Service Assn. (SIRSA) goes over much of the same ground. (Its membership includes some of the companies that also belong to PESA, but the over-all interests are broader, taking in such giants as Chrysler Corp.).

SIRSA expresses much concern about FCC's proposal to allow use of only 180 watts of input power for licensees in business radio service.

It is recognized, SIRSA's petition argues, "that the industrial radio service was originally set up on the concept that there was a need for radio for special industrial users in rural areas."

Moreover, it goes on, use of the service is still mainly in rural areas, and it would be "inconsistent with the basic concepts . . . to propose a reduction in power at this stage of development."

API's Central Committee on Radio supports the argumuents as to why the industrial radio service should not be abolished.

"While many of the licensees serve other important segments of industry, and not the petroleum industry exclusively," the API brief says, "their services are so vital to the petroleum industry that we must urge the commission with utmost vigor to provide a high-priority radio service for these high-priority users, at least equal in quality to the present industrial radio service."

API also objects strenuously to FCC's proposal to let the new manufacturers' radio service share some frequencies now allotted to the petroleum radio service, whose users include drilling and production companies.

The FCC suggestion, API says, is based on "an apparent misconception . . . that the two services would not conflict." In some areas this would be correct, API concedes, but it is a minor concession.

For, the brief continues, "the area of greatest congestion in the petroleum service is also an area that is already heavily dedicated to manufacturing, as well as an area in which manufacturing is also rapidly expanding."

. . . Both for Itself and for Others

Industrial radio service often plays a vital role in general emergencies, enabling the oil industry to lend a helping hand to the public.

This was vividly demonstrated in Louisiana after Hurricane Audrey had devastated the coast. With normal telephone communications destroyed, oil and other mobile radio units filled the gap by transmitting rescue and aid messages 24 hours a day for several days.

And in the Texas Panhandle blizzard last winter, a truck carrying an expectant mother to a hospital was stranded in a snowdrift. A radio call from an oil supply company truck brought quick help, and got the woman safely to the hospital in time.

What's New / IN THE INDUSTRY

Two Drilling Firms Quit in California

Two California drilling contractors —Gene Reid Drilling, Inc., and Green & Heiser Drilling Co.—are going out of business.

Gene Reid Drilling, one of the oldest and largest contractors in the San Joaquin Valley, will liquidate its assets and dissolve. The company operated five rigs.

Green & Heiser said it would sell its two rigs to Brown Drilling Co.

Both companies cited the same reason for going out of business—lack of adequate return on investment.

Gene Reid Drilling, formed in 1942, had drilled about 2,600 wells, cutting more than 8-million ft. of hole. Green & Heiser was formed five years ago and had drilled 152 wells, totaling nearly 1-million ft. of hole.

•

29 Gas Fields Combined

The Texas Railroad Commission this week combined 29 Bend conglomerate gas fields in Jack and Wise counties, North Texas, into a single field to be known as the Boonesville field.

Rules for the combined area will become effective Nov. 1.

The action resulted from a long hearing that started May 15 on the petition of Lone Star Producing Co.

The petition was opposed by Warren Petroleum Corp. and Christie, Mitchell & Mitchell.

The combined area covers 251,000 acres, with 219 wells that had been assigned to 29 separate fields.

The original petition asked for the combining of 362 nonassociated gas wells assigned to 89 separate fields.

The rules call for 320-acre proration units.

•

Socony Strike Ends

Socony Mobil Oil Co.'s East St. Louis refinery started up again this week, a move that could lead to the end of purchaser proration of crude in three states by the affiliated Magnolia Petroleum Co.

The plant had been closed for 17 weeks by a strike of Local 7-644 of Oil, Chemical & Atomic Workers. The strike-settling agreement, reached last Friday, follows close to the industry pattern that was established last spring.

The new pact provides for a 5% wage increase for the 480 employees, effective last Apr. 1, with an additional 1% hike, effective last May 1; four weeks vacation after 20 years' service; and improved holiday benefits.

A strike by 50 St. Louis bulk plant employees was also settled by a new agreement, similar to the refinery pact.

Socony estimates that it may take three weeks for the refinery to reach full-stream operations.

At the start of the strike, Magnolia cut its crude buying by 15% in Texas, Louisiana, New Mexico, Oklahoma, and Illinois. Last week the company lifted its proration in Texas and Louisiana for October.

•

Carson Firm on Quotas

Matthew V. Carson, imports administrator, gave further notice this week that he plans to adhere strictly to the voluntary imports plan spelled out by the Cabinet committee.

He turned down the requests by Eastern States Petroleum Co. and Sinclair Oil Corp. for higher quotas. Last week Carson turned down similar requests by Standard Oil Co. (Ind.), Standard Oil Co. (Ohio), and Tidewater Oil Co.

The only exceptions made by Carson so far were requests for higher quotas by International Refineries, Inc., and Northwestern Refining Co.

International Refineries, with an original allocation of 10,900 b/d of crude imports, had requested an increase to 15,000 b/d. It was granted an allocation of 12,250 b/d. Northwestern, with an allocation of 10,000 b/d, was granted its request for an increase to 13,500 b/d.

Both International and Northwestern had sought higher quotas based on errors in listing their past imports.

•

Magnolia Petroleum Co. et al No. 1 Sterba, the deepest test ever drilled in Oklahoma, recovered gas and distillate on drillstem test at 14,414-19 ft.

A new pay discovery for the west side of the Cement field, the test had been drilled to 20,426 ft. (page 30), and was plugged back to the Springer (Pennsylvanian) sand.

On the test, the flow of gas was at a rate of 1,865,000 cu. ft. a day. Distillate yield was 8 bbl. in two hours. Recovery was 3,000 ft. of distillate.

•

Bay Refining Co., a subsidiary of Dow Chemical Co., plans to boost its refining capacity at Bay City, Mich., by 4,500 b/d to 15,000 b/d.

The expansion will involve the installation of a new crude topping unit, completion of which is planned for next October.

Richard Stewart, Sohio Vice-President, Killed

Richard S. Stewart, 47, vice-president for production of Standard Oil Co. (Ohio), died last Sunday in the crash of a Sohio plane on Summit Mountain, near Jumonville, Pa.

Stewart's wife, Ruth, and four others were also killed in the crash, in which there were no survivors. The others lost were the two pilots, Theodore O. Krauss and Warren F. Noonan, and Mr. and Mrs. Thomas M. McLaughlin, Cleveland neighbors of the Stewarts.

Stewart had been to White Sulphur Springs, W. Va., for an annual physical checkup required by the company.

Stewart had been production vice-president since July 15. Previously, he had been vice-president and assistant to the president.

He began his career with The Texas Co. in 1932, after graduation from Cornell University. He joined Sohio in 1938 as a power engineer.

In World War II, Stewart served in the Petroleum Administration for War and also on special duty in the Navy.

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PETROLEUM WEEK

The oil imports controversy will build to a climax around March. That's when the key House Ways & Means Committee will get down to serious study of the Administration's proposal to liberalize our foreign trade program further. And by then, success or failure of Eisenhower's effort to hold down crude imports will be apparent. The trade law barely escaped crippling amendments in 1955; it faces even tougher going in 1958. If U.S. oil producers join the group seeking to overhaul the trade bill, there's increasing doubt it can pass.

The Administration is determined to hold down oil imports—at least until the trade bill is safely through. You can see that in its tough attitude toward importers' pleas for higher allocations—also in the close watch being kept over residual imports and imports of crude into District 5. Both may be included in the restriction program if they're necessary to make it work. The Administration's philosophy is simple: Better to give an inch now than be pushed a mile by Congress later.

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Watch the Canadian Parliament for a tipoff on future oil policies. Washington sources say that in a week or so the Canadians will hold their first big debate on natural resources policies since the Conservative Party gained power. Questions raised will probably include (1) whether oil and gas exported from Canada should be priced higher; (2) whether the Dominion is endangering its own future oil sufficiency by too-high exports; and (3) what should be done to guarantee more Canadian ownership and control of resource industries. Creation of a National Conservation Board will be discussed. Although anti-American action is unlikely, the debate should help pin down sentiment toward U.S. oil companies north of the border.

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A new report on oil pipeline capacity should be ready by Nov. 1. A National Petroleum Council committee failed to finish its study of transport capacity—including pipelines—in time for last week's meeting. But it is hoping to have it ready for release within about three weeks. The new data may prove important not only to defense planners, but to adversaries in the imports squabble.

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Discount talk of a super buying agency at the Pentagon. Some military officials, especially in the Navy, like the Hoover Commission's proposal to abolish specialized procurement offices like the Military Petroleum Supply Agency in favor of one big agency handling all types of supplies. The idea has some support on Capitol Hill. But top Pentagon officials oppose the notion, on the ground that it would create a nightmare of red tape for both suppliers and the military.

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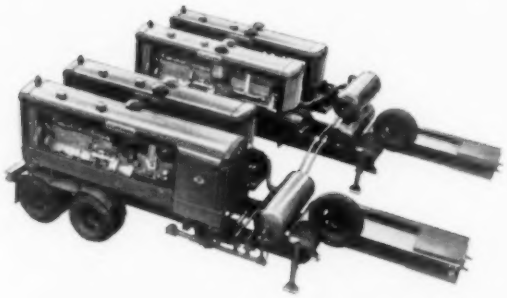
Offshore operators will be affected by new Coast Guard regulations. Heretofore only larger vessels have been covered by the Coast Guard's inspection and licensing requirements. But starting June 30, 1958, regulations under a 1956 change in the law go into effect. These will require all for-hire vessels carrying six or more passengers to pass inspection. Thus, personnel boats used by offshore operators will be included. And pilots of such vessels must now possess ocean operators' licenses.

DRILL FASTER, CHEAPER WITH AIR



Here is a portable air package designed to meet heavy duty, continuous service requirements of drilling contractors and service companies.

1800 cfm at pressures to 275 psi or 900 cfm at pressures to 500 psi. The two-trailer air drilling package shown consists of one trailer with two Model 600 oil-field type compressors . . . the other with one Model 600 compressor and one Model 2-A oilfield booster compressor.

Minimum rig-up time . . . just hook up the hose and drill. These highly maneuverable units are available in many combinations of Schramm compressors and boosters. You can select the capacities you need for pressures up to 1500 psi.

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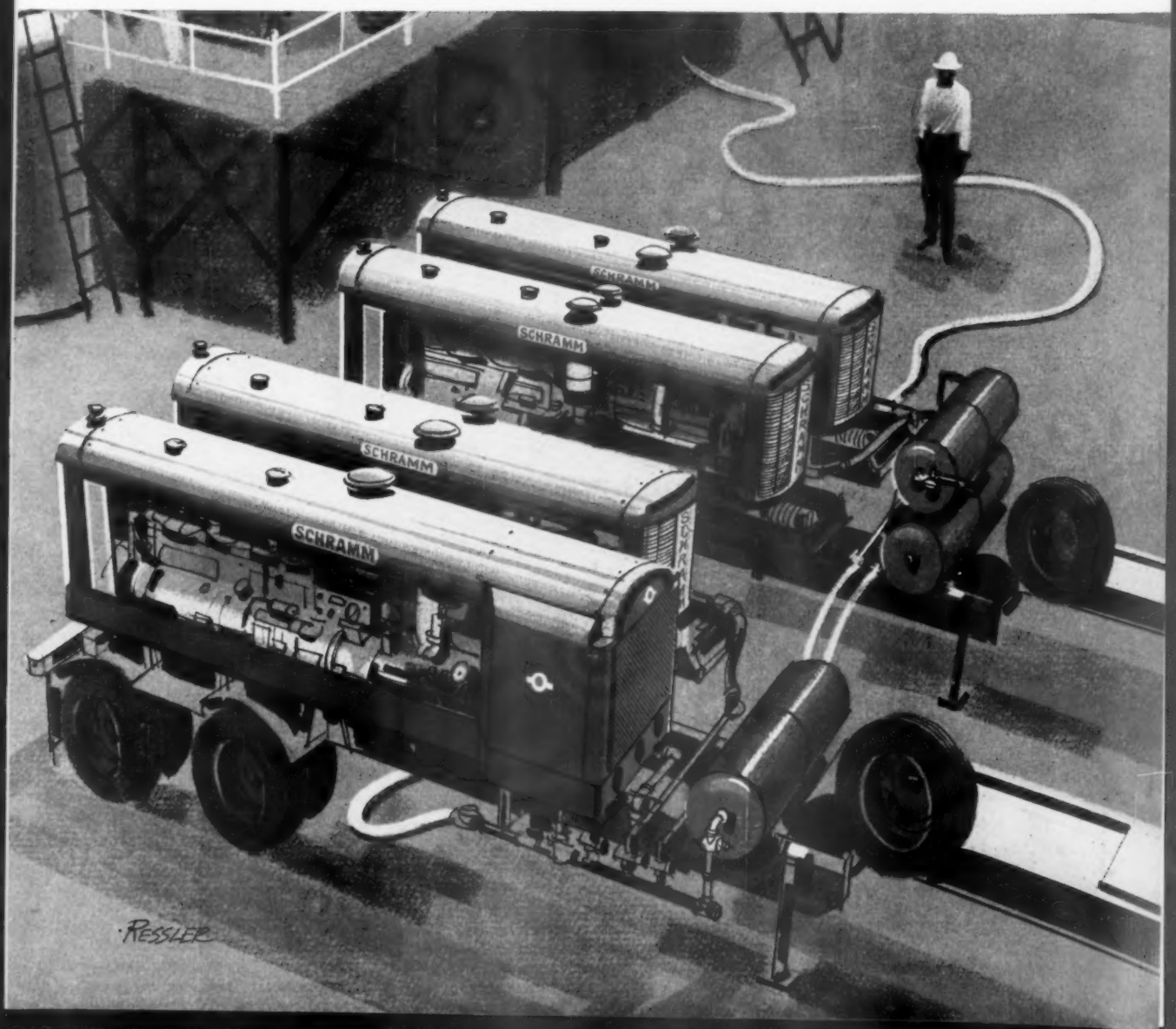

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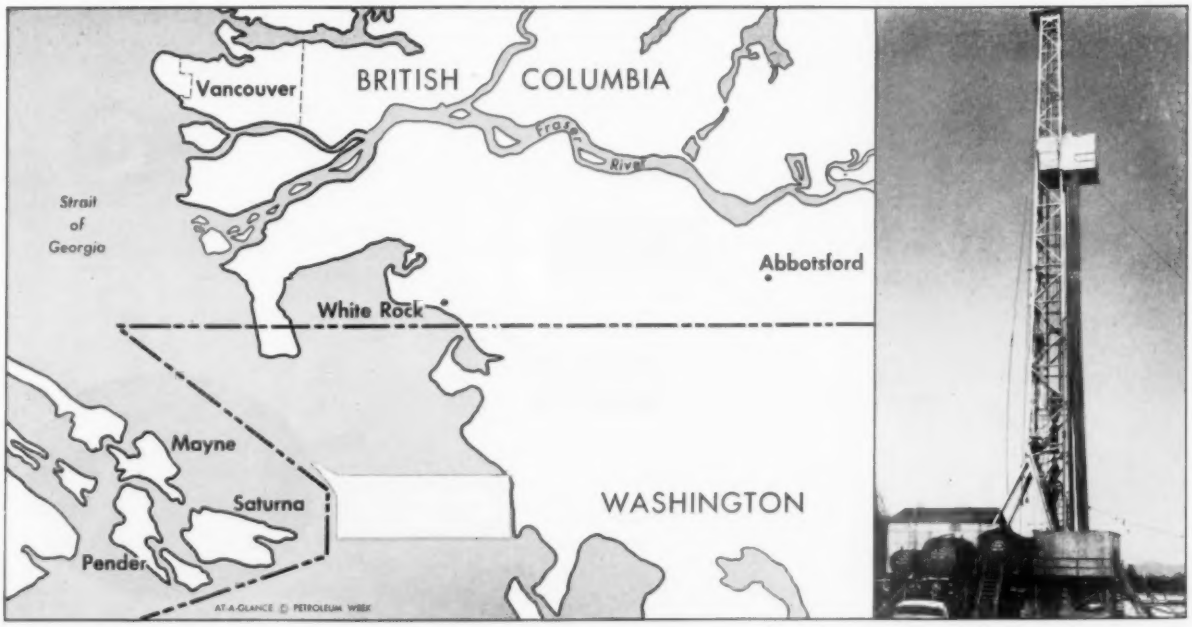


SOUTHERN BRITISH COLUMBIA may become the contin ent's next oil and gas province, some observers say. The 145-ft. Wilson Giant rig (right), largest ever seen in Canada west of the Rockies, is typical of modern equipment being used as . . .

Canada's Fraser Valley Is Stirring

Exploratory interest is mounting rapidly in the oil potential of southern British Columbia. Hopes are that the entire Pacific Northwest may become the continent's newest oil and gas area.

The provincial government confirms that oil companies have filed on more than 1-million acres on the West Coast since July.

(In the adjoining state of Washington, 700 applications for leases have been made since the August discovery by Sunshine Mining Co. near Ocean City, 180 mi. south of Vancouver. Initial tests showed controlled flow estimated at 175-200 b/d of 40-gravity oil through perforations at 3,952-58 ft. The flow has been cut off until contracts for sale of the oil are completed. Sunshine is spudding in three more tests in the northern coastal areas.)

British Columbia's mines minister, Kenneth Kiernan, reports 34 firms have taken out exploration permits in the Fraser Valley, Gulf Islands, and Vancouver Island. This marks the first time extensive exploration has been made in the Gulf Islands, off the southern mainland.

Fraser Valley contains two-thirds of the province's population, and a large percentage of its industry and commerce (including major oil refineries), and is crossed by pipeline facilities. Hence, discovery of production could have a big effect on economic development of the area.

Previous drilling ventures have hit pockets of gas and some oil stains, but nothing conclusive.

Present focal point of BC activity is the Fraser Valley, where 48 previous attempts to find oil in the past 70 years failed to come up with a single commercially productive well. Latest and strongest hope is the Key-Hercon site near Abbotsford.

Key Oil & Gas Ltd. and Hercon Petroleum Ltd. are drilling below 7,846 ft., a third of a mile deeper than any previous test in the area.

The Key-Hercon site is on a 62,500-acre leasehold stretching 22 mi. along the U.S. border north to the Fraser River. The test is in T13.

Company officials report micro and electric logging tests carried out two weeks ago showed six "very good" porosity zones. Most encouraging is a 70-ft. zone below the 7,750-ft. level in which "substantial" showings of high-grade crude were found. A 28-ft. zone at the 7,650-ft. level also is considered another promising zone.

Halliburton Oil Well Cementing Co. now is carrying out formation tests at the site to discover possible pressure buildups, particularly in the lower zones. Results of these tests will decide whether acidizing or fracturing will be used to complete the well.

Gas- and oil-saturated sands were found, but not in producing quantities, after marine structures were found at 6,100 ft.

Raymond Shaw, Key Oil president, told PETROLEUM WEEK that some of the sands were rich enough that a 10-12-in. layer would provide enough oil for commercial production.

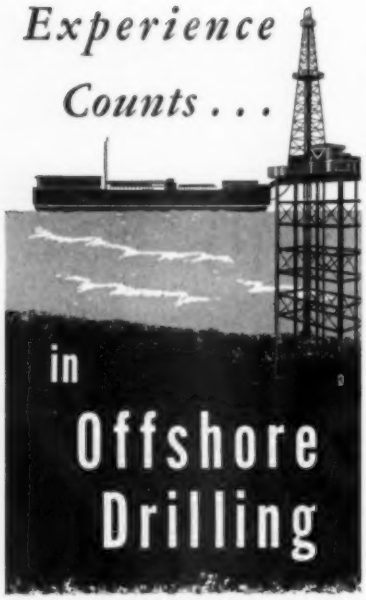
"There have never been such favorable indications in the Fraser Valley," Shaw said. "From our recent showings, I would say our job now is not to find oil, but to get this well into production."

Drilling at the site started a year and a half ago, after extensive aerial photography, gamma ray, electrical, and geological surveys. "All tests proved positive," Shaw said.

Drilling at the Key-Hercon site has been tough, and expensive.

Local strata formation caused some difficulty, reports geologist Harold Brett, "because there is a larger variety

Experience Counts . . .



in Offshore Drilling

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EQUIPMENT

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Reading and Bates is a dependable contractor with seasoned, experienced men operating their rigs. Contracts are fulfilled to the last letter.

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of formation in the geological structure of the valley.

"Layers of standstone alternate with layers of shale in indiscriminate fashion. This complicates the problem of keeping drill bits in good shape.

"A soft bit, used for chewing through shale, is quickly dulled when it runs into sandstone, and must be removed. Sometimes we put on a soft bit for shale, and run into sandstone right away. That means making a trip out of the hole and the loss of drilling time.

"Drilling for oil in the Fraser Valley is a tougher job than in Alberta."

But drilling has proceeded steadily, despite the formation troubles.

So far, more than $190,000 has been spent on the operation.

Cost of drilling is being shared by Key Oil & Gas and Hercon Petroleum on the basis of percentages held in the permit (Key acquired 75% interest in the original exploration permit, held by James R. Jamison, of Edmonton, and gave 31½% to Hercon).

The 145-ft. Wilson Giant rig being used is the largest ever seen in Canada west of the Rockies.

Drilling in the White Rock area, 22 mi. south of Vancouver, has a double object: (1) to find oil, and (2) to prove up underground gas storage possibilities.

Five companies are participating in this venture, at No. 1 Big Horn, near White Rock, about 1 mi. north of the U. S. border at Blaine. Crews are now coring below the 4,000-ft. level.

The companies involved are Big Horn Petroleums Ltd., Royal Canadian Ventures Ltd. (operators), Van Tor Oil & Gas Ltd., Peace River Petroleums Ltd., and Richwell Petroleums Ltd. Drilling contractor is Delta Gas & Oil Co., of Vancouver.

The companies are primarily interested in oil and gas discoveries, but they are prepared to spend "considerable amounts of money" to prove up the underground storage possibilities of the area. Such underground storage areas are still new to the Pacific Northwest.

This means defining the whole field, an expensive project but one that will pay off if such storage proves practicable.

The companies have oil and gas rights to more than 200,000 acres of Crown and freehold land in the islands and on the lower mainland.

Drilling so far has indicated a high-porosity type of sediment needed for underground storage. Gas would be pumped into the porous zones in summer and kept in reserve until the heavy demands of winter.

Oil and gas exploration also is being made for the first time in the Gulf Islands, off the BC southern mainland, just west of the U.S. border.

The first drilling rig is going up on Saturna Island by Charter Oil Co. Ltd., Pacific Petroleums Co. Ltd., and Canadian Collieries Ltd., which have teamed up for the operation.

R. K. Farris, president of Charter Oil, the operator, says diamond bit drilling will start immediately. He adds that two major oil companies have asked to join the operation, but no decision on their entry has yet been made.

Immediate drilling also will start on either Mayne or Pender Islands, Farris says. Maximum depth is set at 5,000 ft. and total depth will be cored for geological information.

The positive geological structures of the Fraser Valley have not been determined to any depth.

The Fraser delta follows the old valley of erosion to Vancouver, extending north to the foothills of the Coast Range and about 30 mi. south of the river.

A fault 8 to 10 mi. in width, near Langley, in the heart of the Fraser Valley, separates the valley into two geologic basins.

The Cowichan, or Nanaimo, Basin starts on the east side of Vancouver Island, extends into the Straits of Georgia under the Gulf Islands, and continues east to Langley. Length is about 80 mi. and maximum width is 25 mi. The Big Horn exploration at White Rock and the Charter Oil Gulf Islands sites lie within this basin.

The Ferndale Basin runs east of Langley to Agassiz. Its 35-mi. width extends south into Washington state and north to the extremity of the Fraser Valley.

(The Ferndale Basin was picked as "the next area in North America to enjoy a major oil find" by the National Geophysicists convention in 1956.)

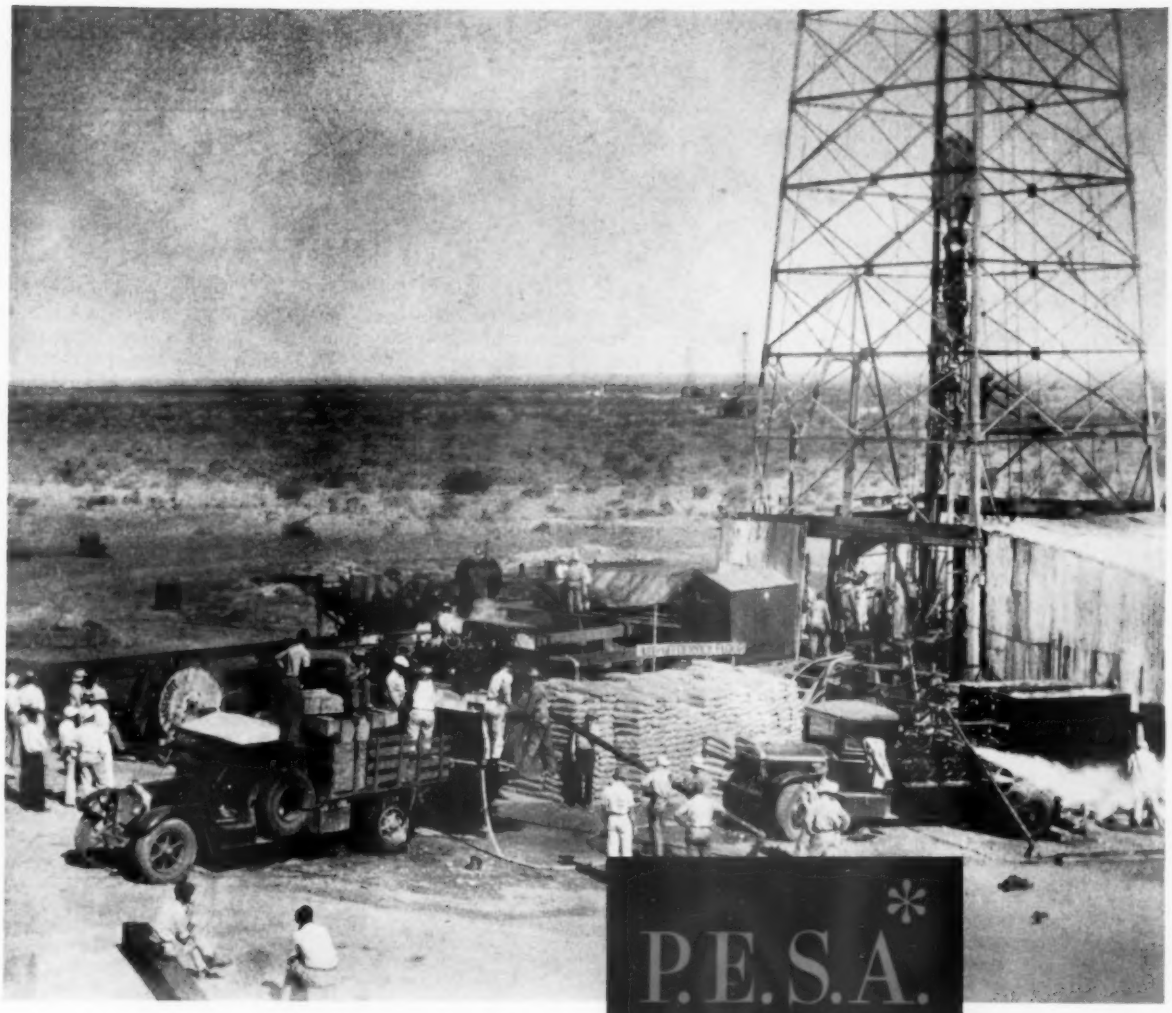
Marine structures in both basins are covered by thick sedimentary layers of sandstone and shale. At the Key-Hercon site, within the Ferndale Basin, depth of this layer is 6,100 ft. The last 100 ft. has formations of "granite wash containing young lime being fractured by primary and secondary fractures," according to Key-Hercon geologists.

In the Nanaimo Basin, the stratified sediment covering the marine structure is estimated from 6,700 ft. to more than 10,000 ft. at the southeast end of the basin.

Marine structure of both basins is believed to be very highly fractured.

First drilling in the Fraser Valley

Deepest test in the world - 1935 model!



The McElroy Number 103 of Upton County, Texas was started in 1933 and completed in 1935 by a major oil company. It set new records for cost, time to complete, and weight of casing string.

This test was the deepest, (12,786 feet), the most expensive (over $1,000,000) and had the heaviest string of casing (10,301 feet of 7⅝") ever used. It took longer to drill, (over two years) and used more bits (965) than any other well. *Moreover, no important producing formations were discovered.*

This is an excellent example of the kind of BIG pioneering you operators have done. It's a big reason why the oil industry is one of the most progressive in the world.

As a result of this experiment, we—the manufacturers, supply and service companies that now make up PESA—applied the lessons you learned and helped you develop better bits, better mud control practices and stronger tubular goods. Cooperation like this makes the oil industry strong.

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PROUD TO BE PART OF A PIONEERING INDUSTRY

was in 1890, when a "heavy gas flow" —according to old records—was struck at 600 ft. near Port Haney by the Canadian Pacific Railway, which was searching for coal.

Intermittent activity followed the gas discovery.

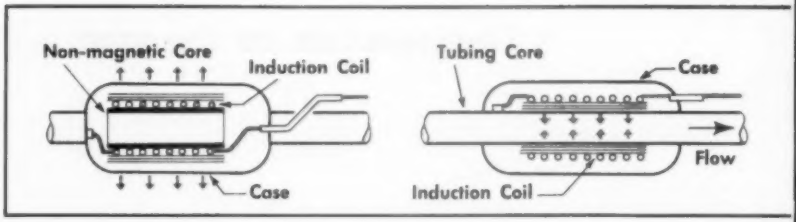
There was a flurry of activity in 1914, when more than 15 companies were formed to explore oil possibilities in the valley.

None of these attempts went below 2,000 ft. Interest in the valley waned, and then revived in 1933, when several more companies were formed to explore the valley. None of the subsequent drilling, however, resulted in a producing well.

Deepest hole prior to Key-Hercon's Abbotsford test was at Boundary Bay, where several companies had drilled intermittently since 1918. The deepest hole was abandoned at 6,044 ft. in 1955.

Despite all the previous failures, officials of companies now working in the area believe strongly in the valley's oil potential.

Key's president Shaw notes that none of the previous drilling reached marine structure, thus neither proving nor disproving that oil exists in the valley.



BOTTOM-HOLE HEATER transfers heat through steel case heated by coils.

TUBING AND FLOWLINE HEATER transfers heat to flowing oil or gas.

New-Type Heaters Boost

A new type of electric well-bore heater is proving successful in boosting recovery of low-gravity crudes in an East Texas field.

The new heater has been in operation since early April in a low-gravity, asphaltic-crude well, owned by Trice Production Co., Longview, in the Trice Field, Wood County.

The heater is said to:

- Prevent freezing and hydrate formation.
- Eliminate paraffin-plugged lines.
- Facilitate the flow of viscous oil.
- Operate automatically.

The heater, offered by Marimac Oil Corp., differs from other heaters in that it uses a current induction system rather than the resistance principle of heating, says the company.

In the induction method used by Marimac, explains company president H. J. McDonald, wire is wrapped around a central core. Passage of current through the wire creates heat, which in turn heats the core.

The resistance principle uses wires with a low resistance to electricity. The wires become hot and give off heat, somewhat like the coils of an electric stove.

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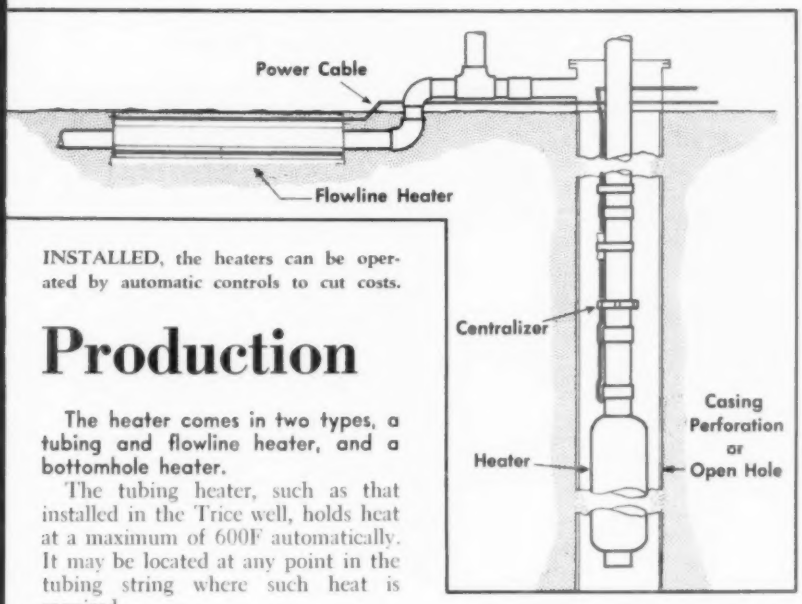


INSTALLED, the heaters can be operated by automatic controls to cut costs.

Production

The heater comes in two types, a tubing and flowline heater, and a bottomhole heater.

The tubing heater, such as that installed in the Trice well, holds heat at a maximum of 600F automatically. It may be located at any point in the tubing string where such heat is required.

The tubing heaters are built on a 2-in. tubing core and are 3½-in. OD, with length ranging from 23 ft. to 33 ft.

The flowline heaters are built on standard line pipe, permitting easy connection into gathering or flow lines.

The bottomhole heater differs in that heat temperature is held to a maximum of 400F. The method of controlling maximum temperature in the coil winding is said to prevent carbonization of the oil and destruction of the heater through overheating.

The bottomhole heater also has an arrangement of reflectors and baffles, which direct the heat outward.

The bottomhole heaters range from 3½-in. to 4-in. OD, and from 20 ft. to 33 ft. in length. Dimensions and operating characteristics can be modified to fit individual requirements.

Field tests in East Texas, in the Texas Panhandle, in Oklahoma, and in New Mexico resulted in production boosts ranging from 25% to 200%.

Marimac's McDonald says that the 6,000-ft. Trice well, for example, had an accumulative yield of only 20 bbl. of 10-gravity crude in a year of test operations before a bottomhole heater was put in.

Efforts at recovery through hot water circulation were unsuccessful, and a $70,000 investment was in the process of being written off.

In the first day of pumping operations after installation of the heater, McDonald says, the oil yield was 103 bbl. Daily recovery since then has ranged from 38 bbl. to 43 bbl. Another Trice well in the field is being equipped with a heater.

In the Trice well, the heater is hung at the 2,000-ft. level. It is connected directly to the tubing, and temperature is maintained at a constant degree to warm the oil as it passes, permitting lift, and preventing clogging.

McDonald adds that two wells in the Paul's Valley field, Oklahoma, are now being pumped where previously they had not produced.

The company believes there is about 50-million bbl. of low-gravity crude in a four-county East Texas area that will lend itself to this method of recovery.

In some fields, this oil is being produced. But, economically, it is on the borderline of being non-commercial. In other fields, little or no attempt is being made to recover it.

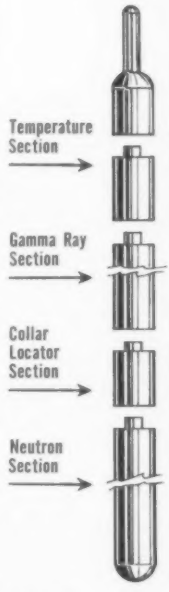
In East Texas, this viscous oil is found in numerous fields producing from the Paluxy sand, the Clarksville sand, and the sub-Clarkesville sand, centering in Wood County. The most difficult to recover are the Paluxy and sub-Clarksville sands.

The heater is an outgrowth of 10 years of experimentation on an original heater designed by R. H. Jarvis and T. L. Jarvis, of Ft. Worth.

Originally, the heater was licensed to Perelex Co., of Houston, with which McDonald was connected as general manager. After dissolution of Perelex in 1955, Marimac Oil Corp. was formed with home offices in Evansville, Ind.

No license has been granted yet to manufacture the heater or to distribute it. Right now, United Machine Co., of Ft. Worth, is building the heaters for Marimac.

Produces Six Logs on Single Run



Save double service charges and reduce rig time (plus the cost of a Temperature Survey) by using WORTH WELL SURVEYS' new 6-in-one logging service.

Worth Well Surveys' new multi-section down-hole tool makes six logs in a single run into a well. By using dual recorders in the instrument truck, the following logs are produced:

1. Temperature, going into the hole.
2. Gamma ray, 2" per 100'
3. Gamma ray, 5" per 100'
4. Neutron, 2" per 100'
5. Neutron, 5" per 100'
6. Casing Collar Log, coming out of hole.

Eliminate the extra run into the hole by using the latest in well-logging technique.

Field offices maintained at Midland, Odessa, Andrews, Crane, Texas, and Hobbs, N. Mex.

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FEderal 7-8353

Hobbs, N. Mex.
EXpress 3-6325

Midland, Texas
MUtual 3-1052

Crane, Texas
Phone 3574

Oklahoma Hole Hits A Cost Barrier

DRILLING HAS STOPPED at the Magnolia No. 1 Sterba, Oklahoma's deepest well. Here the rig is seen through a frame made by a shallow pumping well.

It was the cost, finally, that stopped the drilling at Oklahoma's deepest well, Magnolia's No. 1 Sterba, in Caddo County.

The state's record-depth hole had reached 20,426 ft. before a halt was called. It had already bettered the old state record by 2,268 ft.

The men and equipment were still holding up, able to go deeper even though progress was slow. However, Magnolia and the companies associated with it decided to stop and plug back to a shallower depth which had shown oil signs (PW—Sep.27'57, p13).

Magnolia, with 42% interest, and Phillips Petroleum, with 32%, are majority interest holders. Others are Gulf (11.5%), Sunray Mid-Continent (11.5%), Anderson-Prichard (2%), and Pan American Petroleum (1%).

The deep-drilling operation was a smooth one all the way. There was no work interruption, and that bogey of all deep holes—the fishing job—was successfully avoided.

The contractor is Big Chief Drilling Co., of Oklahoma City.

The well had 5,899 ft. of open hole, below 7⅝-in. casing set at 14,527 ft. Jack Abernathy, vice-president of Big Chief, said his crews had no trouble coming out or getting back on bottom while changing bits.

Bit life below 20,000 ft. was around 20 hours, cutting from 10 to 15 ft. of hole. It took 11 to 12 hours to make a round trip (altogether, 161 bits were used down to 20,178 ft.).

Abernathy was highly complimentary of the mud program at the Sterba. "The Magnolia engineers kept the hole in wonderful shape," he said.

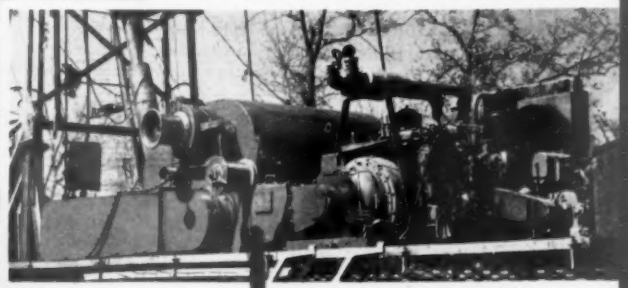
As the hole reached its deepest

A CREW RELAXES, tired but not unhappy. Left to right: Howard Holder, Roy Harrelson, Dale Anderson, Joe Heald.

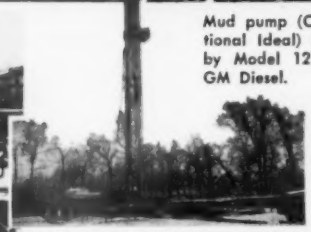
IT'S A BIG JOB, drilling so deep. But the No. 1 Sterba had the equipment, as shown by this substructure.

DEPENDABLE POWER

Power for drawworks is provided by Model 8107 GM Diesel Engine.



Mud pump (C-150-B National Ideal) is powered by Model 12103 Model GM Diesel.



Johnson Drilling Company Truck-mounted portable rig in the Tyler area.

"OPERATED MORE THAN TWO YEARS WITH NO MAJOR REPAIRS."

That's how T. J. Johnson of Tyler, Texas, head of the Johnson Drilling Company, describes the new application of GM Diesel engines that powers the hard-working portable rig shown above. A Model 8107 GM Diesel Engine provides power for the Spencer-Harris Drawworks and a Model 12103 GM Diesel Engine operates the mud pump. This well, in the Tyler area, was drilled to 6300 feet with 3½-inch drill pipe and eight drill collars.

Stewart & Stevenson — Industrial Power & Supply Co. parts and service? "Most satisfactory," says Mr. Johnson.

And here are this contractor's ratings of other important factors:
Performance — "Superior."

Dependability — "Engines are ready to deliver at any time called upon."

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point, a 15.2-lb. mud weight was being carried with about 3,000-lb. pressure.

The hole never reached the original goal, the Ordovician. The formations it did encounter were: Rowe, 4,025 ft.; Niles, 4,375 ft.; Wade, 4,804 ft.; Nedrano, 5,536 ft.; Marchand, 5,650 ft.; Deese, 6,750 ft.; Upper Dornick Hills, 10,541 ft.; Lower Dornick Hills, 12,835 ft.; Springer zone, 13,537 ft.; Springer sand, 14,008 ft.; brown shale, 19,604 ft.; Caney lime, 19,920 ft., and Sycamore (Mississippian), 19,970 ft.

A core in the Springer at 14,334-53 ft. showed 19 ft. of stained sand, and it is this zone that is to be tested now.

Magnolia utilized normal drift of the bit with the formations. By following the formations, rather than fighting for a straight hole, the well ended up under an offset location rather than below the rig. The Sterba was drilled on a 1,420-acre unitized lease.

(A similar technique worked in the Knox deep play, 30 mi. southeast of the Cement area, with most wells in that area "directionally" drilled in the same way—going with the formation)

One of the unique features of the rig was a new mud-pump application. Big Chief and Gardner-Denver Co. engineers worked out an adaptation of six-cylinder, single-acting plunger pumps to meet anticipated need for sustained mud-circulation pressure of between 3,500 lb. and 3,750 lb. at the Sterba. The pumps originally were designed 12 years ago for use in California in connection with cementing, acidizing, and other high-pressure work.

The pump set-up was built around two Gardner-Denver PL-7 pumps, each using a 12-cylinder Climax V-125 engine, rated at 605 maximum hp. at 1,200 rpm. Under this hook-up, each engine operated at 1,050 rpm., driving through a Clark Equipment Co. 26 BKR converter, and a Fawick 28-in. air clutch, then through a countershaft in the chain case with a 1:1 chain ratio to the jack shaft, and a 6:1 ratio from the jack shaft to the main shaft. The pump operates at a maximum of 150 rpm. under this arrangement.

Each pump has a 7-in. stroke and is arranged in two banks of three cylinders each, pancake style. Either or both banks can be operated at the same time, thus allowing a wide range of volumes and pressures. Initial plans called for operating one bank at a time on each pump, holding the other banks in readiness in case of breakdown, or failure.

With one side in operation, each pump has a capacity of 105 gal. per minute at about 3,000 lb. pressure while turning at 120 rpm.; at the same speed, when both sides are used at once, each pump has a capacity of 208 gal. per minute at about 2,500 lb. pressure.

The PL-7 pump has three 4¾-in. and three 3½-in. diameter plungers, affording a volume of more than 300 gal. per minute while operating at maximum rpm. High-pressure work is accomplished at reduced speeds with either bank of cylinders, with maximum pressure of 3,000 psi. on the larger plungers, and 10,000 psi. on the smaller ones. Only the 3½-in. plungers were used at the Sterba.

The pumps were designed by Gardner-Denver for truck mounting, and were engineered within 8-ft. lengths, to meet road limits.

The rig itself (Rig No. 2 for Big Chief) had a National drawworks. The drawworks were powered through a compound by three Climax V-125 engines, generating a combined maximum of 1,815 hp.

The derrick was a Lee C. Moore, with a 142-ft. cantilever jack-knife mast rated at 830,000 lb. The rotary was a 20½-in., 250-ton Continental-Emsco Type JCS.

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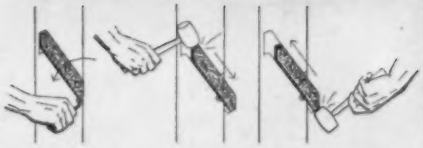
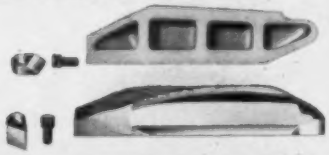


1. **WINGS ARE EASIER TO CHANGE**—Worn wings can usually be changed without removing the body from the string. Wings are machined to close tolerances to insure interchangeability and proper fit. Corrosion and galling are prevented by "Parkerizing." Wings can be quickly removed or installed even after rough usage and exposure to corrosive mud, salt water, etc.



2. **WINGS DO NOT COME OFF IN THE HOLE**—Wings are made of ductile iron—a new material with the castability and machinability of gray iron and the mechanical properties of cast steel. This material, plus a positive lock, prevents wings from coming loose in the hole.

3. **WINGS ARE EASILY WASHED OVER**—Although the use of ductile iron gives the wings greater strength, wash over operations can be accomplished with the use of a conventional wash over shoe. Wings are cored for easier milling and to minimize the amount of material removed. No large pieces to foul up the hole.

4. **WINGS ARE CAST ON A HELIX**—Casting wings on a helix allows smooth rotation in the hole with *maximum* stabilizing contact with the wall of the bore hole. All contacting surfaces are hard faced with tungsten carbide for maximum resistance to wear.

Servco Model B Stabilizers are available in a complete range of sizes—all of which will accommodate surveying instruments. For complete information see pages 4710 and 4711 in the Composite Catalog or write for Folder.

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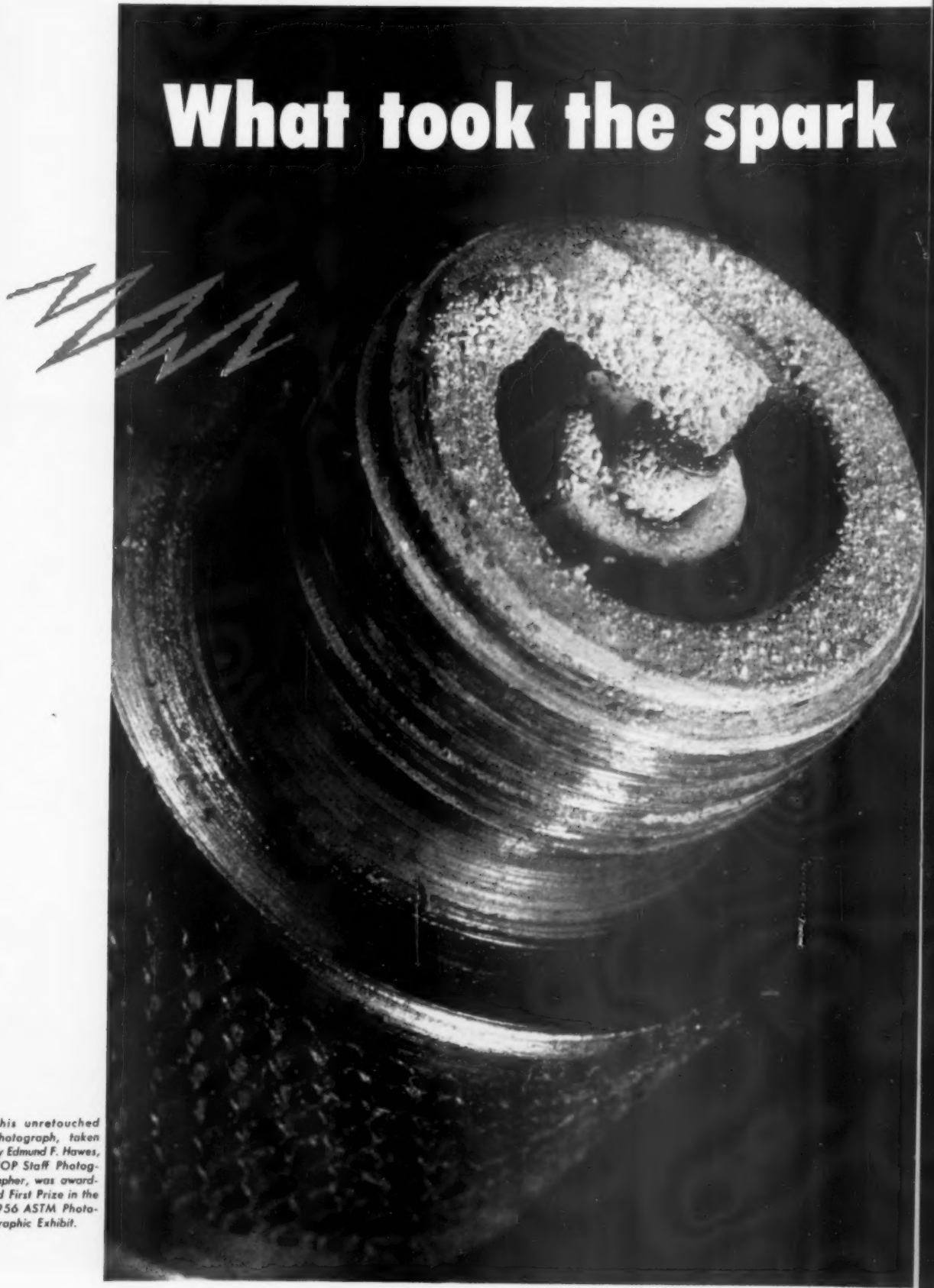
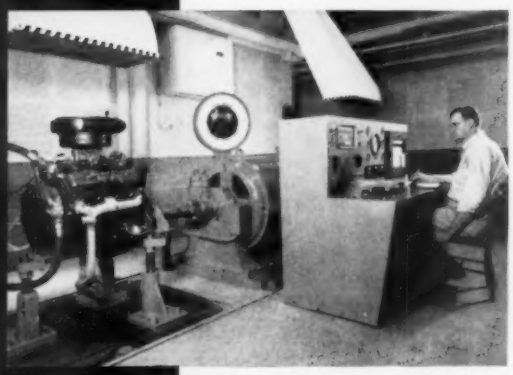
What took the spark



This unretouched photograph, taken by Edmund F. Hawes, UOP Staff Photographer, was awarded First Prize in the 1956 ASTM Photographic Exhibit.

out of this plug?

The old problem of the fouled-up spark plug is less acute today because of modern improvements in petroleum refining. Most refiners are taking the utmost precautions to make sure that the motor fuels they produce burn clean, quick and with the full power needed for today's high compression, high-speed engines. Throughout the refining industry research technicians are constantly checking the fuels their refineries produce to help guard against plug fouling and to maintain all the high performance characteristics demanded by today's automotive engines. In this way they are helping to make and keep the products you market salable. Here at UOP, in our business of developing processes for the manufacture of motor fuels, we also never take our eyes off the performance of the end product. Our research and technical staffs are constantly concerned with the fuels made by UOP processes to make sure that these will have the performance qualities that will give their ultimate users full satisfaction. This is only part of the broad contribution research is making toward the salability of products from petroleum. Wherever you market, you can be sure that "men of science" are constantly working to keep the products you sell at the quality level your customers demand.



This is a modern V-8 engine and dynamometer used in the UOP Engine Laboratory to analyze all phases of motor fuel performance including engine cleanliness test. It is one of the tools used by UOP technicians to develop methods for producing fuels having all of the characteristics necessary to satisfy the petroleum marketers' most demanding customers.

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What's New / IN PRODUCTION

Miscible-Fluid Injection O.K. in Small Projects

Miscible-fluid injection appears to be a worthwhile venture even in a small-scale secondary recovery operation.

This is borne out by estimates made last week in connection with the application of Cities Service Oil Co. to conduct such a program in the 1,100-ft. sand reservoir under its Gussman-Waggoner "G" lease, section 32, block 4, H&TC survey, Wilbarger County Regular field, North Texas.

A company spokesman told the Texas Railroad Commissioin that present plans are to inject 20,000 bbl. of propane over a six-week period and then to inject dry gas. He said a water block is planned to prevent migration of oil across property lines.

The applicant estimated that additional oil recovery over primary means by the proposed process will amount to 85,000 bbl., with an increase of 35,000 bbl. expected over waterflood operations.

•

Land Ruling Appealed

A test of condemnation powers for directional drilling of oil and gas wells beneath river beds will be reviewed next month by the Texas Supreme Court.

The dispute involves a state lease of mineral rights below the Rio Grande River. Coastal States Gas Producing Co. now holds the lease on 85 acres in Hidalgo County. It has a gas well drilled directionally from a riverbank location.

In the suit against J. E. Pate, El Texano Land Co., and other surface owners, Coastal seeks to condemn nearly two acres being used as a location for the rig, and 5.7 acres to provide access.

A lower court decision held that the law does not specifically grant permission for condemning riverbank drilling locations under such circumstances. The state attorney general is joining Coastal in its appeal.

•

Aneth Estimates Vary

Conflicting estimates of primary recoverable reserves at Aneth pool, San Juan County, Utah, were given last week in a hearing before the state Oil & Gas Conservation Commission.

Shell Oil Co. testified it believes the pool contains at least 182.5-million bbl. of primary recoverable 40-gravity-plus crude in the Paradox zone.

In previous testimony, The Texas Co. estimated the pool's reserves at 152-million bbl.

The commission is hearing an application by Texaco, Carter, and Continental for an 80-acre spacing rule. Shell, Standard of California, and Gulf are seeking 40-acre spacing.

Shell's witnesses testified that, contrary to evidence presented by Texaco experts, Aneth's pay was 40 ft. thick, was not homogeneous, and was a layer type deposition, not a low reef.

Shell's geologists gave Aneth 240,000 bbl. of crude for each 40 acres; Texaco gave 400,000 bbl. of crude under each 80 acres.

Under Shell's proposal, 760 wells would be drilled at Aneth, compared with 380 under Texaco's plan.

•

Properties Change Hands

Coloma Oil & Gas Corp., Corpus Christi, has bought producing properties in ten different Southwest Texas fields from Burdette Graham and H. C. Heldenfels, Trustee.

The company is believed to have paid about $1-million cash for the 13 leases, comprising 4,238 acres.

The leases, with 15 producing oil wells and 14 gas wells, are in Nueces, Aransas, Refugio, and Live Oak Counties.

Titan-Tex Drilling & Production Co., a new company, has acquired its first producing oil and gas properties—an interest in some 22 wells owned by Ratliff Oil Co., Pass Christian, Miss.

The transaction involves eight wells in Springhill field, North Louisiana; six wells in Bethany field, Texas; four wells in Blocker field, Texas; two wells in Ft. Barre field, South Louisiana; and one well in Rodessa field, Texas.

Price was not announced.

American Trading & Production Corp. has bought five 12,000-ft. Devonian wells in Gladiola field, Lea County, N. M. The properties, involving net reserves "substantially in

Today, more than ever before in history, oil is a vital commodity of freedom. And the tanker that carries oil is truly a citadel of freedom.

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CITIES SERVICE

excess of 500,000 b/d," were purchased from Texas Crude Oil Co., Ft. Worth.

A Texas oil man has purchased an interest in 21 producers in the Smackover-Snow Hill field in Southern Ouachita County, Arkansas.

Delbert L. Powell, of Tyler, Tex., bought the interests from Don H. Speaker, of Pueblo, Colo., for an undisclosed sum.

•

Two oil and gas lease sales of more than 40,000 acres of state-owned land in North Dakota have netted $449,254 in bonuses.

The first sale, conducted by the Bank of North Dakota, brought bonuses totaling $148,072 on 11,375 acres.

The second sale, by the state land department, brought bonuses of $301,182 for 29,166 acres.

Interest centered on leases in Burke County, where recent discoveries have been made. Top bid was Northern Natural Gas Producing Co.'s $71.50 per acre for a 640-acre tract 12 mi. west of Flaxton field, in the state sale.

•

Sunshine Mining Co. has acquired 400,000 acres in oil and gas leases, and options, in Washington State.

Sunshine says this is in addition to its block at Ocean City, where its discovery well has resumed production, with the oil going to the new Tacoma refinery of U. S. Oil & Refining Co. A second test is under way near the discovery site and is expected to be completed by Dec. 1.

•

Pan American Petroleum Corp. is seeking authority to extend its waterflood pilot injection program to include the entire Salt Creek field, Natrona County, Wyo.

Pan American began its pilot program in January, 1955. Up to now, it has injected more than 3.1-million bbl. of water into nine injection wells. The field is Wyoming's greatest producer.

•

A repressurization program is under way at Red Wash field, Uinta County, Utah, by Standard Oil Co. of California.

The plan will be expanded if the present experimental drilling on a 40-acre basis proves economical.

Standard is engaged in a program of hiking output at Red Wash in connection with paralleling of crude transmission lines in the Uinta Basin by its subsidiary, Salt Lake Pipe Line Co.

•

The Montana State Land Board will continue its policy of five regular land sales a year, despite a slump in lease bidding so far this year.

Only $46,825 was offered for 44 tracts of school land at the August sale—the lowest amount bid since the late 1940s.

The next lease sale is scheduled next week; and a final sale for the year about mid-December.

•

Houston Oil Field Material Co. has acquired a controlling interest in Oil Equipment Ltd., Calgary.

The transaction was completed by the two companies in Calgary in late September. Details were not disclosed.

•

Drilling Highlights

West Texas—Devonian production has been opened in the Midland County portion of the Spraberry Trend. Tex.-Harvey Oil Co. No. 1-16 Mrs. B. W. Floyd et al, section 16, block 37, T-3-S, T & P survey, flowed 316 b/d of 43-gravity oil through ⅜-in. choke and perforations at 11,192-512 ft. Gas-oil ratio was 3,238:1. The well originally was completed in the Spraberry in 1949, after having been drilled to 12,063 ft. and plugged back. The well was the opener of the Tex-Harvey Spraberry field, one of about 20 Spraberry fields consolidated into the Spraberry Trend. When Spraberry production declined, the well was then drilled out to the Devonian horizon.

Utah—Continental Oil Co. No. 10-A Navajo, section 32-41s-24e, San Juan County, flowed an estimated 50 bbl. per hour of 40-gravity oil on 30-minute drillstem test in the Pennsylvanian at 5,663-712 ft. The wildcat is 2 mi. southwest of White Mesa field (formerly East Desert Creek) and 2 mi. northeast of Desert Creek field. If the two fields are joined, a producing trend of more than 6 mi. would be formed.

Oklahoma—Anderson-Prichard Oil Corp. No. 1 Coleman, section 14-2s-4w, Stephens County, has established McLish (Ordovician) production in the Milroy field. On drillstem test through perforations at 7,618-74 ft. the well flowed at the rate of 1,190,000 cu. ft. of gas daily in 3 minutes, and 93 bbl. of oil in 23 hours through various chokes.

In Woodward County, Sinclair Oil & Gas Co. No. 1 Gilbert, section 1-23n-20w, 7 mi. from production, flowed at the rate of 6,160,000 cu. ft. of gas daily on 1-hour drillstem test at 7,521-72 ft. Recovery was 275 ft. of heavily distillate-cut mud.

Alberta—California Standard Co. and British American Oil Co. No. 7-33 Calstan-B. A. Iosegun, Lsd 7-33-63-19-w5, Beaverhill Lake oil discovery in the Kaybob-Iosegun River area, 130 mi. northwest of Edmonton, flowed at the rate of 50.4 bbl. per hour on drillstem test at 9,911-80 ft. On previous test at 9,855-907 ft., the wildcat flowed 130 bbl. per hour of 42.5-gravity oil.

Mississippi—Marlin Exploration Co. No. 1 Pierce-Butler, section 15-5n-3w, Adams County, is a Wilcox sand discovery about 1 mi. north of Glen Aubin field. The well flowed 228 b/d of 44-gravity oil through ¼-in. choke and perforations at 6,663-66 ft.

South Louisiana—Texas Pacific Coal & Oil Co. No. 1 Louisiana Rice Milling Co., section 41-9s-3w, Jefferson Davis Parish, gas-distillate discovery 2½ mi. west of the Jennings field, flowed 228 b/d of 46.8-gravity distillate through 12/64-in. choke and perforations at 10,592-668 ft. Gas ratio was 168,000:1.

Texas Gulf Coast—Phillips Petroleum Co. No. 1 Thompson Trustee, Galveston County, flowed 563 b/d of distillate through small choke and 77-million cu. ft. of gas daily from 20 ft. of a 48-ft. sand section beginning at 9,090 ft. The gas-distillate well, third wildcat success scored by Phillips in this area this year, is 10 mi. east of Chocolate Bayou field and 3 mi north of Hitchcock field.

Texas Panhandle—Pan American Petroleum Corp. No. 1 Huff, section 5, block 1, A&GN survey, Hansford County, a Cleveland sand discovery, recovered 215 bbl. of oil in ten hours through ½-in. choke and perforations at 6,341-45 ft, 5,382-85 ft., and 6,396-401 ft. Operator earlier recovered gas at the rate of 5-million cu. ft. daily on production test of the lower Morrow at 8,188-99 ft.

Also in Hansford County, The Texas Co. No. 1 Etter unit, section 143, block 4T, T&NORR survey, was completed for 847 b/d of 41-gravity oil through 1-in. choke from the Cleveland at 6,400-14 ft. and 6,422-32 ft. Location is 1½ mi. northeast of the Buzzard Morrow sand field.

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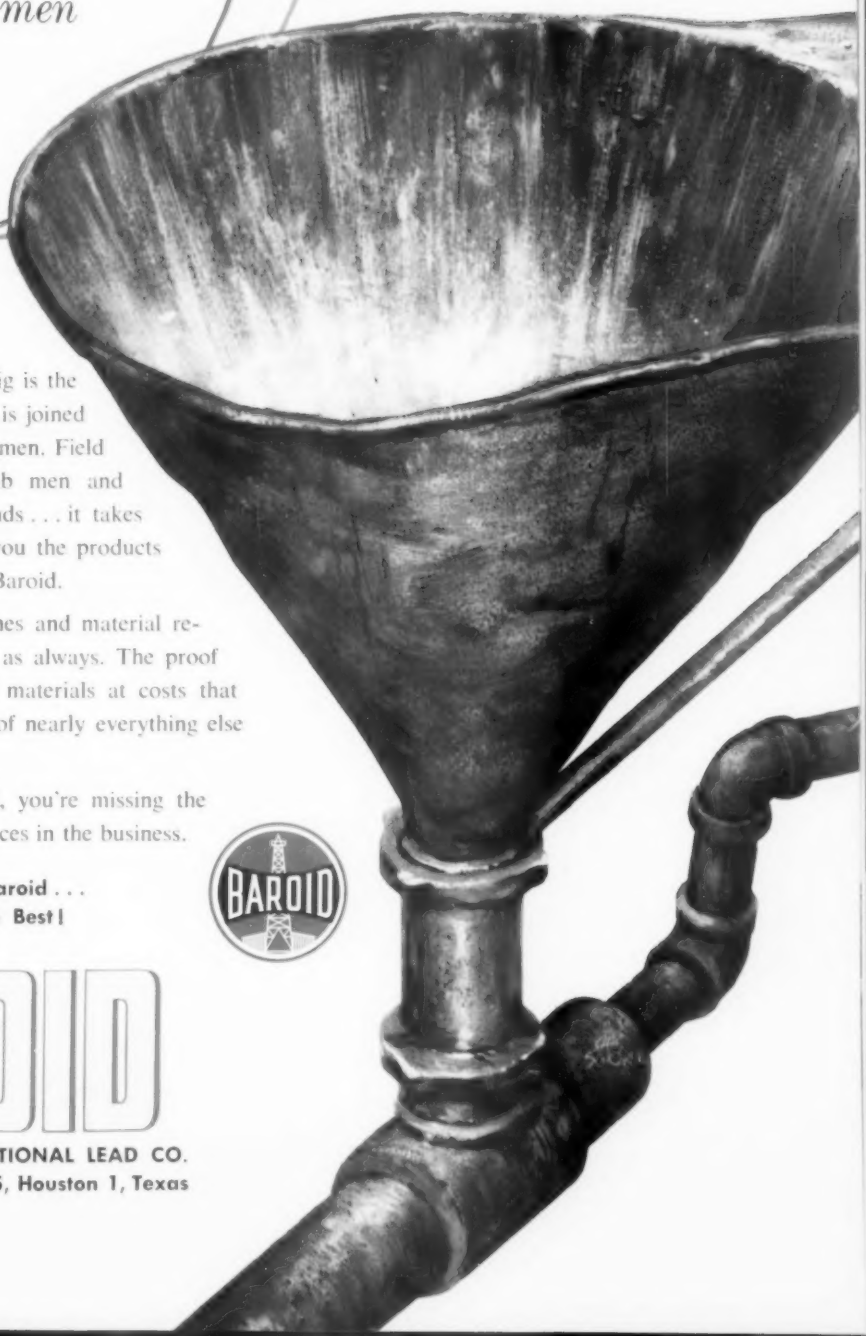

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DEPT/Oil Men at Work

Toolpusher Bud Fletcher Gets Around

"Stick with me and you'll see the world," toolpusher Bud Fletcher tells his crews. There's a lot of truth to what he says, too.

In the past few years, Fletcher, an employee of Coastal Drilling Co., Bakersfield, Calif., has served as toolpusher on a variety of exploratory drilling jobs in remote parts of California, Nevada, and Oregon.

In 1954 he was toolpusher on the big rig that drilled Shell Oil Co.'s discovery well in Railroad Valley, Nev.—the first producer in that state.

In 1955 he sweated out some lonely months on Santa Cruz Island, off the coast of California, drilling a pair of dusters for Richfield Oil Corp., first wells ever drilled on the island.

In 1956 he was toolpusher on Sinclair Oil & Gas Co.'s 12,880-ft. duster in Lane County, Ore., the deepest well ever drilled in the Pacific Northwest.

Bud's present assignment is typical. He has been pushing tools on the rig that found the first oil on Alaska's Kenai Peninsula. The well was completed last week.

His headquarters—and home—since shipping out last March have been in a 40 ft. two-bedroom housetrailer at the site of Richfield Oil Corp.'s No. 1 Swanson River Unit, on location 40 mi. southwest of Anchorage. For Bud, who stands 6'1" and weighs in at 225 lb., the housetrailer has most of the comforts of home, including an electric refrigerator, diesel stove, insulation, and double floor to keep out the cold.

Before leaving for Alaska, Bud told friends he would rather go north than to Four Corners. "I've heard the mud comes up to your knees at Four Corners," he said. Now he is not so sure. The spring thaw hit Alaska just after Bud and his crews finished rigging up, turning the ground into a springy sea of mud. For the first eight weeks, before the ground dried out, drilling crews had to commute to the location from their quarters at Soldatna, 30 mi. to the south, in a swamp buggy, the same transportation that is generally reserved for Louisiana bayou exploration.

The area currently falling to the drill is famous for its moose and bears. "The local people say moose is as good as beef," Bud says. "I have to have that proved to me, though."

As for the bears, "I have kind of a deal with the bears. If they leave me alone, I'll leave them alone."

E. E. (Bud) FLETCHER: "Stick with me and you'll see the world."

Last July the Kenai Peninsula wildcat excited keen interest with the announcement that it had flowed at a rate of more than 200 b/d of 31-gravity oil on a test of the interval at 11,140-70 ft.

Speaking of the discovery, Bud says: "I hope it's a good one. This part of the world could stand something besides army money."

The discovery precipitated a new rush to Alaska. "I saw a lot of oil company personnel that I hadn't seen since Nevada," Bud says.

When it comes to experience, Bud has plenty. He has spent almost 30 of his 53 years in the drilling end of the oil business.

Born Ernest Edward Fletcher ("few people know what those initials, 'E. E.,' stand for") in Glenwood, Mo., Bud moved to Iowa at an early age and grew up in Harvey, where his father, an ex-railroader, ran a store.

In 1924, when he was 21 years old, Bud went to California to work in the oil fields. Two older brothers had preceded him. One, C. E. (Red) Fletcher, is still working for Tidewater Oil Co. in the Ventura field. The other, Eddie, has been with Ohio Oil Co. since 1929. In 1953, he served as a toolpusher for Ohio's Paloma deep test in California, a well that went to 21,541 ft., world's deepest at the time.

Bud's first job was in a well gang with American Oil Co. at Fellows, in the Midway-Sunset field. Two years later he joined Shell Oil Co. as a roughneck. Except for the depression, when "everybody took a vacation," Bud worked for shell for 13 years.

He was a driller in 1942 when Shell shut down the rig and shifted Bud and his fellow workers to the pipeline department. Bud quit and went to work in the shipyards at Suasalito, Calif. Two years later he went back to drilling, for Drilling & Exploration Co. In the next four years he drilled for Drilexco, Ohio Oil Co., and Loffland Bros. In February, 1948, he joined Coastal Drilling Co., which had been formed a year before and was just getting a second rig. He quickly became toolpusher, and has been one ever since.

Naturally, Bud has had his share of experiences.

One of the most interesting was in connection with Shell's discovery in Nevada. Because Shell wanted to get more land, Bud and his crews were told to say nothing about the discovery. For six days, in the face of persistent questioning and a few offers of cash or royalty considerations, Bud and his men resolutely kept their mouths shut.

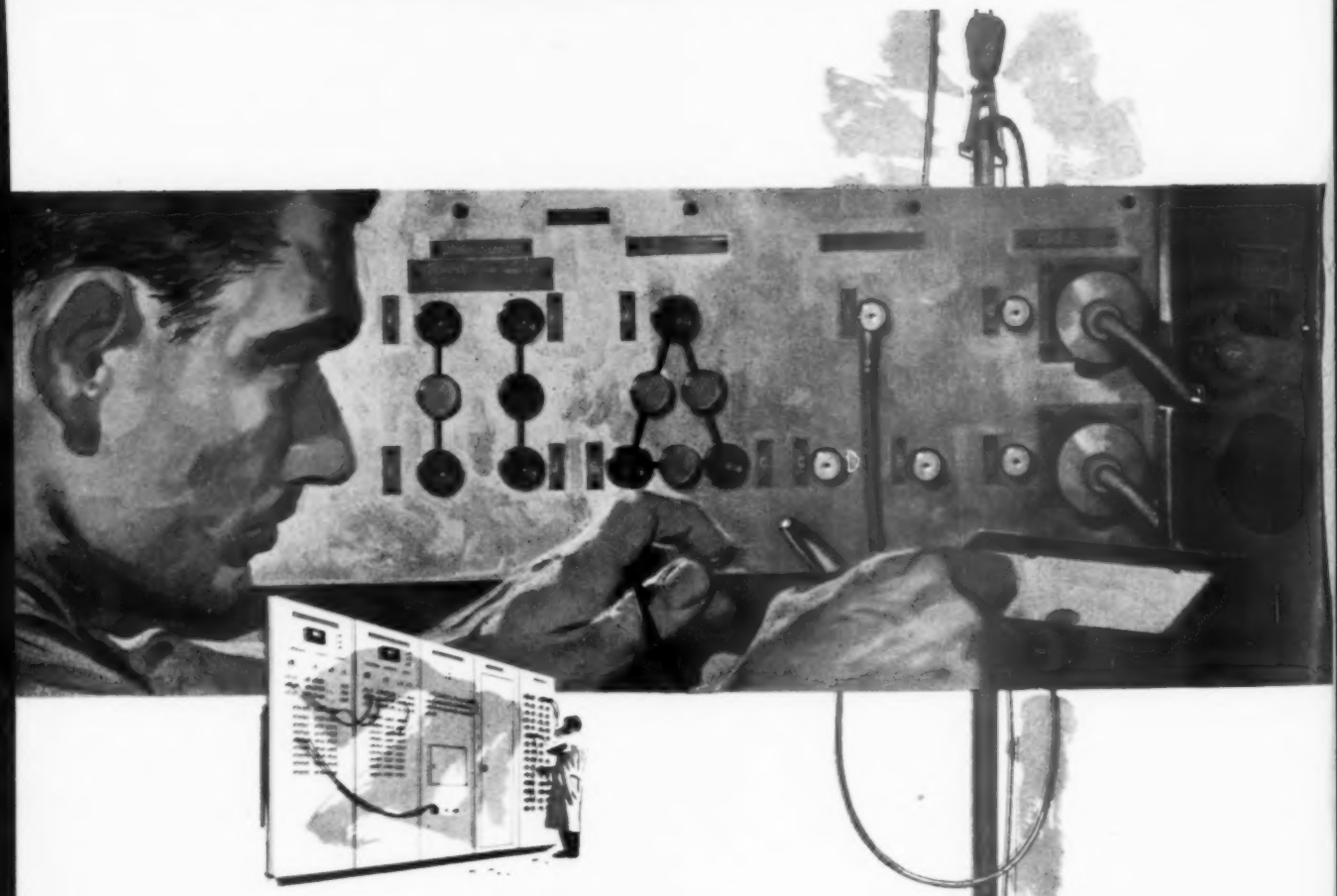
"A scout I'd known on another job came out," Bud recalls. "I rushed him into the trailer for coffee before he could look around. We talked awhile. He finally said, 'I don't know what they wanted to drill here for. There's no oil here.' I kept a straight face and agreed with him. He left without looking in the covered sump where we'd backscuttled the oil."

Another time, in Oregon, where "the rig looked like a toy in a canyon surrounded by 200-ft. trees," it rained 31 in. in 26 days. "A landslide hit the pipe rack and dumped the pipe into the sump. For a time we thought we were going to lose the rig."

Though he and his rambling rig get around, Fletcher still thinks there is no place like home.

He and his wife, Jen, make their home in Bakersfield. They have three children—Milton, 17; Ernie, 12; and Mary Catherine, 10. Ernie visited the Alaskan well last summer, spending 16 days with his dad.

Bud's longtime hobby is fishing. He has plenty of equipment with him in Alaska, but so far he has had little time to use it.



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You cannot lower an idea into a well—it's a long way from original ideas for improved logging methods to practical field applications.

The carrying out of a concept means the design of an instrument that will withstand the shocks, pressures, and temperatures encountered in a bore hole . . . and still deliver precise information.

To aid in this work, engineers at the Schlumberger plant in Houston conduct simulated field tests from their laboratory benches. Each laboratory is wired to a common test well with standard logging cable. A "flick of the switch" in a distribution center connects the logging instrument in the well with the surface recording equipment in the laboratory. This "logging through a switchboard" illustrates the progressive engineering practices utilized at Schlumberger.

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Well Surveying Corporation

PETROLEUM WEEK / SPECIAL REPORT

DRILLING

- In drilling, the long-haul look is optimistic.
- But the immediate outlook is tough.
- New tools and techniques will help.

STORY STARTS ON PAGE 44

In Drilling: Times Are Tough Now

Domestic drilling today is at the crossroads. The situation calls for new outlooks, new practices, and new adaptability by the drilling contractor who wishes to survive. Otherwise, the harsh reality is a future of economic distress. What the outcome will be depends largely on the results of current experimentation with new devices and techniques, all aimed at one target—getting hole down faster, better, and cheaper.

As with production, the big consideration is economics. If anything, it is more pressing for the drilling segment of the industry.

Discoveries are fewer, smaller than ever before. It's costing more money to make them, largely because drilling is deeper and the cost of labor, materials, and equipment is higher.

Drilling contractors are convinced they are close to—if not already at—the saturation point for improving efficiency with current equipment.

The strongest hope is for some major technological breakthrough that will pack the hefty impact of the rotary drill when it first appeared. Today the turbodrill is being closely watched. A Humble Oil & Refining Co. report on its version and a new, favorable evaluation of the Dresser Industries turbodrill top these developments.

Here are some of the more interesting highlights:

- Humble, after eight years of research and field testing, is convinced that a commercial turbodrill will emerge from its efforts.
- A complete drilling report on eight runs of the Dresser turbodrill by Helmerich & Payne, Tulsa drilling contractor firm, concluded that the device can push drilling forward.
- Drilling fluids now are capable of withstanding downhole heat as high as 500F.
- Such equipment as mud cyclones, degassing systems, tools to pinpoint lost circulation zones, better perforating charges, new formation samplers—all are helping to make drilling faster and more economical.
- New techniques, such as deviating a hole by application of hydraulic pressure, rather than by mechanical means, is speeding up the sidetracking process and cutting the cost by perhaps as much as 50%.
- New, exhaustive studies of low-pressure drilling —with air, gas, or aerated mud—underscore the effectiveness of this technique.

For the general outlook on drilling activity, the pessimists can have a field day with the short-range situation. The prospect for the rest of this year and next year is far short of excellent. Long-range, the optimists come into their own. If adequate domestic reserves are to be found, drilling will just have to get better.

There are half-a-dozen good reasons for the present drilling slump, ranging from imports to the political situation in Washington.

Except for such areas as South Louisiana, the Four Corners, and North Dakota, the drilling rate isn't what a lot of people think it should be.

The "old bounce" isn't there. But exponents of the long view feel that drilling simply is in one of its periodic cyclic lows and eventually will rise sharply again.

Turbodrills Continue to Make News

The development of the turbodrill is continuing in the headlines. This week, Helmerich & Payne, Tulsa drilling contractor, made a complete report on one well in which it used the device.

The well was the 7,023-ft. Shell Oil Co. No. 5 Elk City-Rumberger, Beckham County, Okla.

To sink the 12¼-in. hole, Helmerich & Payne used an Oil Well "96" rig with two Oil Well 816P 6x16-in. pumps and three Superior 8G-825 engines with 705 bhp. at 900 rpm. The hole was drilled with 5-in., XH 19.5-lb. drill pipe and three 9¾ x 2¾-in. and ten 8 x 2¾-in drill collars.

The rig also contained a Brantley automatic driller. The manifold was arranged to run the pumps in parallel.

The drill was a Dresser Industries T12M3 9-in. turbodrill.

The purpose, primarily, was to "evaluate turbodrilling in shale and granite wash formations," to "evaluate turbodrilling with low content in the mud system," and to "evaluate experimental 'Y' slot watercourses" in the drill bit.

The contractor's tentative opinion: "As generalized comment on the tool based on this very brief experiment, we think that it can clearly become a step forward in drilling technique."

The use of the turbodrill was basically a Helmerich & Payne risk, because the hole was drilled on a straight footage contract. Shell and Dresser "cooperated fully," however.

Eight turbodrill runs were made, along with nine rotary drill runs for comparison.

The eight turbodrill runs totaled 715 ft. in 28 drilling hours, for a weighted average of 25.6 ft. per hour and 89.4 ft. per bit.

The nine rotary runs drilled 964 ft. in 74¾ drilling hours, for a weighted average of 12.9 ft. per hour and 107.1 ft. per bit.

Because of possible variances in calculating such factors as rig cost, turbodrill rental, etc., Helmerich & Payne preferred not to pin down the exact economic relationship between the turbodrill and the rotary on this hole.

However, the firm said, "the turbodrill did operate economically with the maximum recommended volume in shale and granite wash formations."

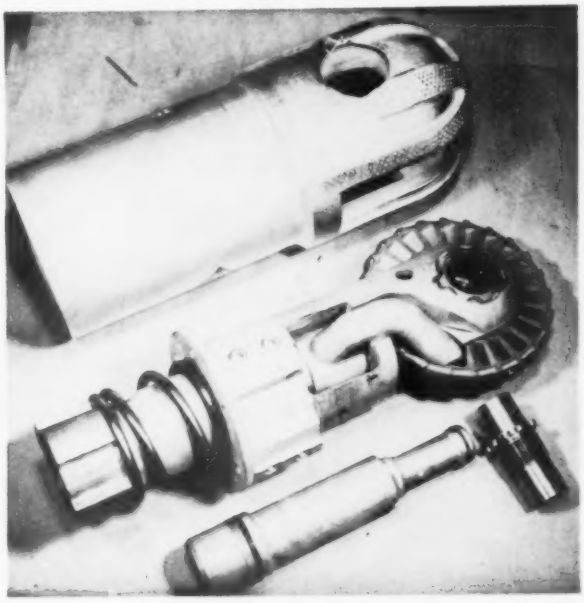
There were indications that, under certain circumstances and conditions, the cost analysis could favor the turbodrill by as much as $1 per ft.

Helmerich & Payne detailed each of the eight turbodrill runs.

First, a 17½-in. hole was drilled to 3,090 ft. At 3,086

ow But the Future Can Be Bright

TURBODRILL built by Humble maintains gauge by a diamond-set reaming shell. This tool was modified to drill 7⅞-in hole.



COMPONENTS OF Humble's turbodrill. Note elements and construction of the turbine and design.

ft., 13⅜-in casing was set, and a 12¼-in. hole drilled to 5,344 ft. where the turbodrill testing began.

Here's what happened:

• **Run 1**—Drilled to 28 ft. in 1¼ hours with an OWC-Reg. bit with "Y" slots. Mud volume and bit weight remained constant at 876 gal. per minute and 38,000 lb. Bit was pulled because of low penetration rate. Examination showed severe off-center wear.

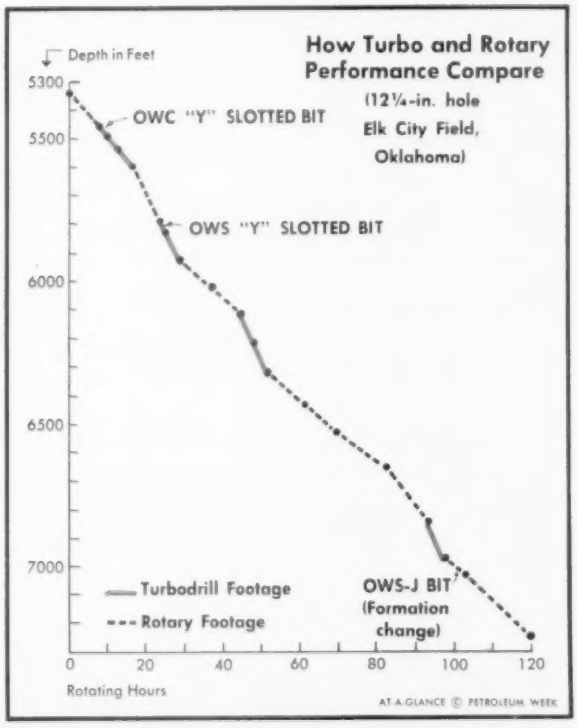
• **Run 2**—An OWS-Reg. bit with ¾-in. watercourses drilled 117 ft. in 3¾ hours. The turbodrill stalled with 61,000 lb. applied to the bit, so the weight was slacked off to 50,000 lb., and mud volume was maintained at 876 gal. per minute. The bit showed heavy bearing wear, one cone locked, and the teeth were dulled.

• **Run 3**—Made with an OWS-Reg. with ¾-in. watercourses, this run totaled 103 ft. in 3¾ hours. The mud volume was dropped from 876 gal. per minute to 828 gal. per minute because of engine heat, and a definite decrease in penetration rate was experienced.

For comparison, a rotary run was made at this interval, utilizing an OWS-J bit with ⅝-in. nozzles, with average volume of 815 gal. per minute and bit weight ranging from 40,000 to 50,000 lb. The bit drilled 87 ft. in 6 hours.

• **Run 4**—An OWS-Reg. with "Y" slots drilled 40 ft. in 1¾ hours with volume maintained at 876 gal. per minute. The turbodrill stalled at 59,000 lb. weight on bit, and the weight was reduced to 50,000 lb. Because of slow penetration rate, the bit was pulled and examination showed a cone had mud-locked.

• **Run 5**—The OWS-Reg. bit with ¾-in. watercourses drilled 99 ft. in 4 hours, including drilling out two



DRESSER'S TURBODRILL was evaluated by contractor Helmerich & Payne. General conclusion: It's a step forward.

bridges and 60 ft. of cavings to reach bottom. Bit weight was held at 50,000 lb. and volume at 876 gal. per minute.

Two rotary runs, for comparison, drilled 191 ft. in 15¼ hours with a bit weight and volume constant at 50,000 lb. and 664 gal. per minute.

• **Run 6**—In 4 hours an OWS-Reg. bit with ¾-in. watercourses drilled 91 ft. with bit weight varying between 48,000 and 50,000 lb. and volume set at 852 gal. per minute. A weight of 53,000 lb. stalled the bit. The bit was pulled because of slow penetration rate. On this run, the flow line temperature was checked at 108F.

• **Run 7**—The same type bit drilled 100 ft. in 4 hours with 40,000 lb. on the bit and volume at 876 gal. per minute. Near the end of the run, weight was hiked to 45,000 lb. without effect on the penetration rate. The bit was pulled because of low penetration rate.

Four comparative rotary runs were made, for a total of 538 ft. in 41 drilling hours. Better results were obtained with the last rotary after oil was added and there was a formation change.

• **Run 8**—With the OWS-Reg. bit having ¾-in. watercourses, this run showed a total of 137 ft. in 5½ hours using weights of 25,000 to 50,000 lb. and volumes of 716 and 826 gal. per minute. The turbodrill stalled at 53,000 lb. of weight. There was no indication of a penetration weight change with the light bit weights and low volume.

The bit was pulled because of a bearing failure in the bit cones. There wasn't, however, any indication that the 7% oil emulsion mud had damaged the rubber bearings.

A comparative rotary run, using an OWS-J bit with 5/8-in. nozzles, totaled 38 ft. in 3½ hours with weight on bit varying from 45,000 to 60,000 lb. and volumes of 616 to 640 gal. per minute.

The test indicated that an oil emulsion mud could increase footage per bit and lengthen time on bottom. Helmerich & Payne also had some other research and testing suggestions.

"The most successful turbodrill run on this test was made with 7% oil emulsion mud," the report noted. "Bit life was increased 37% and bit footage was increased 14.6% over the best previous turbodrill run in this test." The firm recommended further testing under such conditions.

Helmerich & Payne also said, "The need for a pack-off lower bearing housing is great. By packing off the lower bearing housing, on-bottom cleaning action would be increased, which should increase bit life and penetration rate."

During part of the test, highly experimental bits, in which the watercourses were modified into a "Y" in order to send the fluid between the cutting cones, were used.

Helmerich & Payne said the testing of these bits was "not conclusive." One bit was dulled because light weights caused off-center wear. A cone on the other mud-locked in 1¾ drilling hours.

Humble's Turbodrill Scores

Meanwhile, Humble Oil & Refining Co. summed up some eight years of turbodrill research and testing.

The developments were reported this week at the Dallas meeting of the Society of Petroleum Engineers, American Institute of Mining, Metallurgical & Petroleum Engineers, by George E. Cannon, of Humble.

The work started back in 1949 when a group of sponsors, including Humble, set a southwestern research organization to work on a "high-speed, low torque" cutting-elements project.

When this project ended, Humble took it over. The company had a patent on a turbine-driven drilling tool of the type being researched. Humble continued its work until the summer of 1956, when a diamond bit manufacturing company worked out additional developments.

Since then, there have been one laboratory and seven field tests of the tool.

Said Humble this week: "It now appears almost certain that a commercial tool will evolve from this project."

Originally, the emphasis was on developing a tool for drilling hard formations. Then the aim shifted toward a device for drilling softer, coastal formations.

After tests of various areas, Humble determined that "the basic principle of the drill had been demonstrated," and that "a tool of this general design could be made to drill at low applied loads if a suitable cutter material could be found."

Humble had found out, also, that the use of rubber bearings and tungsten carbide alloys "apparently minimized the effects of fluid erosion."

At this point, diamonds came into focus as a possible cutting element. Therefore, in 1956, the diamond bit manufacturer became interested and commenced further development work.

Eventually, this led to building of a 7⅞-in. tool, which has been evaluated in four West Texas tests.

"The original mechanical difficulties now appear to have been overcome," Humble's Cannon reported this week. "On these last four tests a total of 280 ft. has been drilled at a rate of from one-third to two-thirds the rate obtained with rock bits in comparable sections, and with even better results when reduced weight was required with the rotary," Cannon said.

"Principal effort on these tests, however, had been directed toward determining the operating techniques necessary for use of the drill, and to determine its operating characteristics rather than to obtain maximum footage. Tests are now being planned to determine the economic applicability of the drill.

"The principal anticipated application of this tool is in hard formations, which would normally have to be drilled with reduced bit weight due to hole deviation characteristics.

"Since the drill operates without the application of bit weight, this feature should provide a means for obtaining a straight hole through a normal crooked-hole zone with increased bit life and drilling rate. The application of this tool or modification . . . to other drilling conditions is to be investigated."

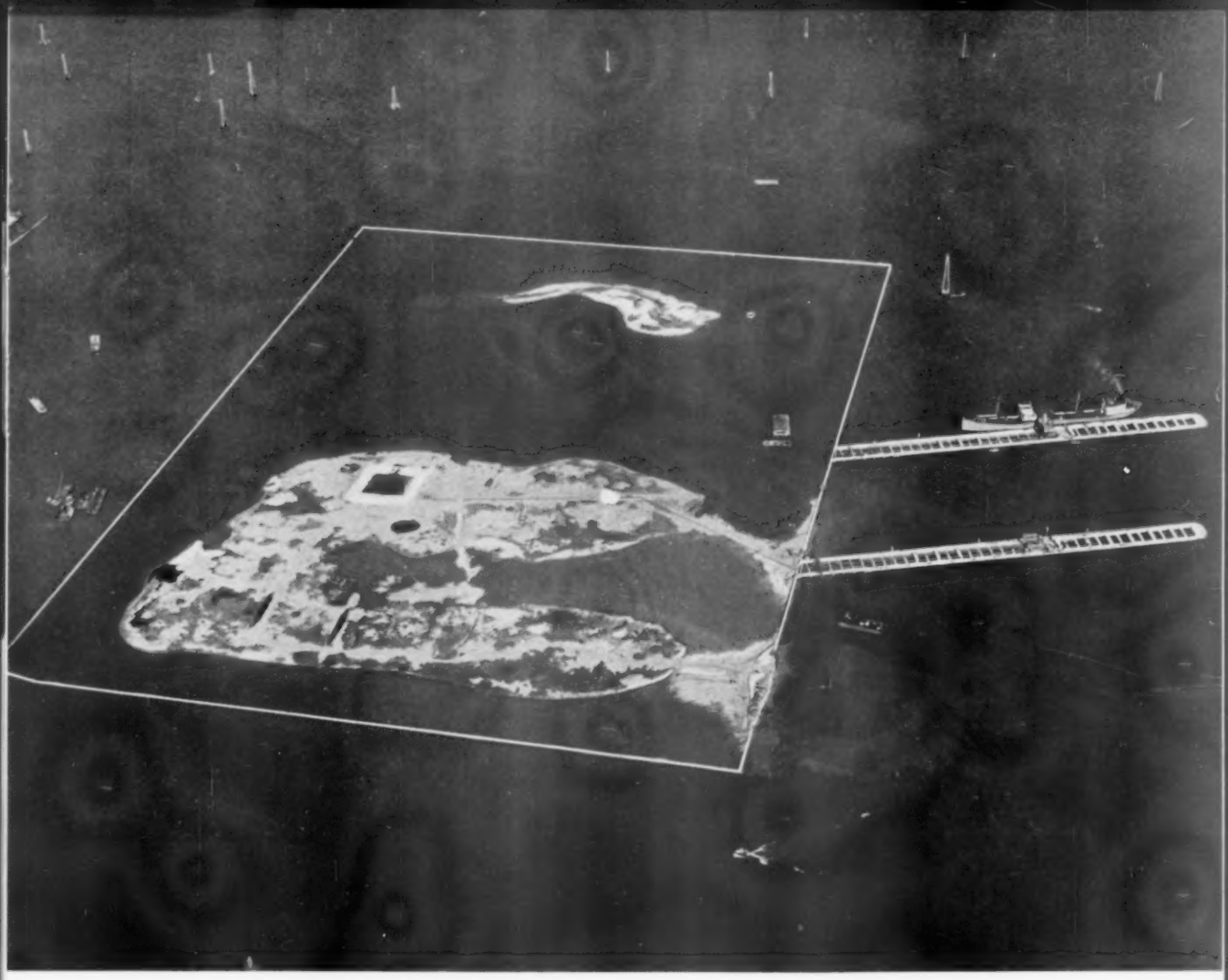
New Ways to Slant-Drill

One of the most interesting techniques is the use of a modified jet bit to deviate a hole to the desired angle without employing a mechanical aid. The California Co. is utilizing this method off the Lousiana coast.

California Co. has drilled more than 25 wells off Grand Isle and the Mississippi River mouth.

"All we're doing, actually," says a company engineer, "is using hydraulic horsepower and a regular jet bit to obtain the kind of angle we want."

Initially, two of the three jets in a conventional Hughes



The order was to build an island...

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**In a joint venture with Brown & Root*

Creole needed additional storage and loading facilities at Lake Maracaibo, and the most feasible way to assure enough space was to build an island a half mile from shore. This is no small task, as you may well imagine. Raymond, working in conjunction with Brown & Root, installed a rectangular 2000 by 2900 foot sheetpile wall as the first step. Currently, the section of the lake enclosed is being filled in. When completed, Creole will have an ample 125 acre island for their storage needs. In addition to the island, two 1100 by 80 foot piers were constructed to enlarge Creole's loading facilities by a considerable margin.

But this is just a part of Raymond's many activities in the booming Lake Maracaibo area. Now under construction is a new manufacturing yard to provide a steady flow of Raymond's prestressed concrete cylinder piles, and other prestressed products, for offshore drilling platforms. Raymond is proud of its role at the important Lake Maracaibo region, and of its service to the industry's growth over the past 50 years. Why don't you, too, investigate the advantages of using Raymond methods, materials and experience on your next project?

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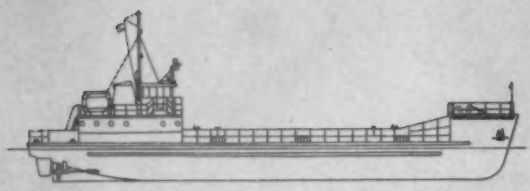

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DIMENSIONS—
Length O.A. 132 ft. 5 in., beam 35 ft.
POWER—2—450 hp.
TONNAGE—Gross, 297 tons
SPEED—11 knots

NEW PROFILES FOR OFFSHORE RIGS

. . . New York Ship-built self-propelled tender and cargo vessel minimize platform investment

A revolution in the concept of offshore drilling is introduced with the commissioning of a powerful mobile team consisting of a completely equipped self-propelled drilling platform tender and a cargo-supply vessel.

The tender is designed to furnish complete operating power, storage, supply and living facilities for the drilling platform. It is equipped with a 60-ton crane, adequate for setting up the platform, and a central power plant capable of supplying power for drilling to depths of 20,000 feet or more. A helicopter port atop the bridge deck, air conditioned quarters for all personnel, complete communication and navigational facilities make this one of the most self sufficient tenders ever built.

The cargo-supply ship provides complete facilities for ship to shore transportation. With a loaded capacity of 605 tons, she is capable of servicing as many as three drilling operations within practical distance limits.

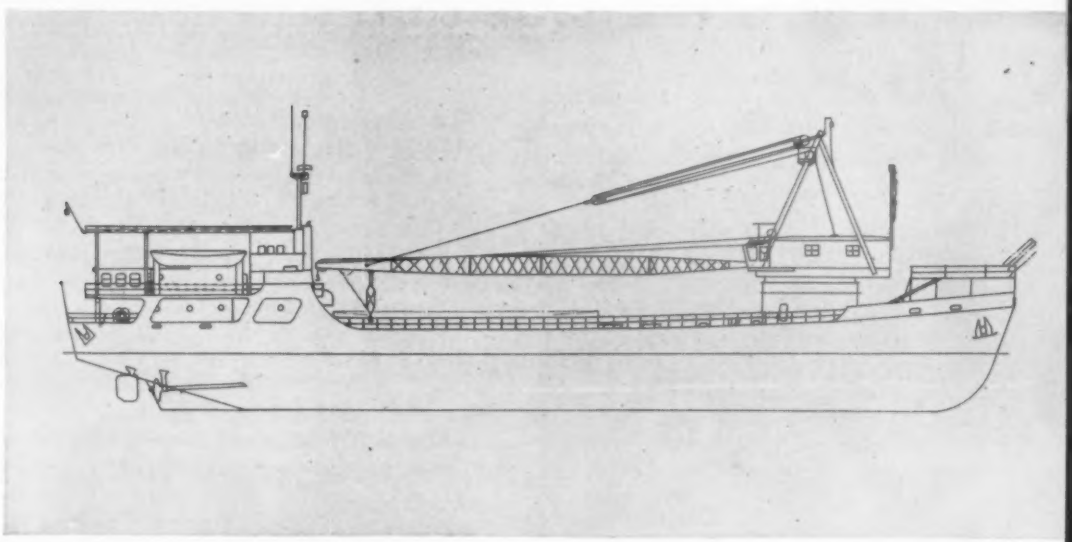
This integrated team eliminates the need for elaborately equipped drilling platforms. A minimum of equipment is required on the platform, since all generating capacity, mud storage, fresh water supplies and maintenance facilities are provided by the tender. Unlike a barge-tender, the self-propelled tender is able to drop her mooring lines at the threat of a storm, and with all platform personnel aboard head for a sheltered cove or into the wind to ride the storm out. The tremendous safety factor thus afforded should be reflected in reduced insurance rates.

With these new profiles in offshore drilling equipment, another contribution is made to the art of special ship types by New York Shipbuilding Corporation.

For your copy of the brochure more fully describing these vessels write for Bulletin 23.

SELF PROPELLED DRILLING TENDER

DIMENSIONS—
Length O.A. 272 ft., beam 56 ft.
POWER—
Central combined drilling and propulsion plant 3,150 hp.
TONNAGE—
Gross, 2,500 tons
SPEED—9 knots



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Tool Co. tricone jet bit were plugged, leaving the third jet to wash out the start of the deviated hole. Now, however, by using one large jet and two smaller ones, California is able to deviate the hole and then drill ahead without the need for changing the bit.

Here's how it's done:

The bit is oriented at the surface. The kelly, and several joints of the drill pipe if necessary, are marked. The drill string is then lowered into the hole to the point where the well is to be deviated.

With the drill pipe stationary, hydraulic pressure is applied. The string is lifted and lowered slightly while under pressure. This causes a washing effect on the big-jet side of the bit.

Once the side of the bore hole is washed sufficiently to achieve an angle, rotation of string and bit is begun and drilling starts.

During drilling, orientation and angle are maintained by orthodox equipment and technique.

The time required for starting the deviation is surprisingly short, varying from as little as one minute to as much as 30 to 40 minutes in rare instances.

The angle can be varied from a slight one to an extreme one. In shallow or salt formations, one engineer says, "we can get almost any angle."

In one instance during early experimentation, the angle shot up unexpectedly to 10 deg. within 50 ft. of drilling. However, better control can now be exercised.

Surface pressures as high as 1,600 to 1,800 psi. have been used, but, ordinarily, pressure is held to between 800 and 1,200 psi.

Actually, California Co. tailors the method to the rig involved, according to the horsepower available from the pump.

It is estimated that the cost of directionally drilling offshore wells in that area can be reduced by as much as 50% by using this method.

At least one other major company is actively investigating the potentialities of the method.

This company, which has been in offshore development for years, has had its fill of the high costs of drilling over-water wells.

So it has an engineering group checking into this less-costly method of directional drilling as part of a program to bring down offshore expenditures.

The technique recalls the utilization of a lateral-acting nozzle for the opposite purpose: helping to drill straight holes and straighten out crooked holes.

The bit, patented by John S. Goodwin and Globe Oil Tools Co., incorporated one nozzle projecting vertically downward, to supplement the action of the bit's cutters, and a lateral nozzle.

This lateral nozzle was designed to wash the side of the bore hole during drilling in such a way that the vertical direction of the hole was "stabilized." Fluid pressures from 800 to 2,000 psi. were suggested.

It was run in California a year ago, with reportedly good results. But the bit is not now in manufacture.

Air/Gas Drilling Gains

Meanwhile, drilling with air and gas is steadily gaining favor. One recent report emphasizes an almost incredibly promising future for the method—provided some of the present difficulties are able to be overcome.

Phillips Petroleum Co. has conducted an extensive, years-long program to find some of the answers to more efficient "reduced-pressure drilling."

Recently, Roy A. Bobo and George S. Boudreaux, of Phillips' drilling engineering division, told the Tulsa meeting of the Petroleum Division, American Society of Mechanical Engineers, that the technique, if used judiciously, "can guarantee large savings to the operator and drilling contractor."

Moving from examples of remarkable increases in penetration rates and bit footages, Bobo and Boudreaux underscored the problems that must be solved if air/gas drilling is to fulfill completely its "assured" future: These problems are:

(1) Water Intrusion.

They pointed out that "weeping" formations can be penetrated if it's done with sufficient care. One of the techniques to prevent cuttings from balling up and sticking the drill string is to add water periodically at the surface. Foaming agents are also thought helpful.

But prolific water zones simply must be sealed off, because the water slows penetration rates, the disposal problem at the surface is too great, and the air and water mixture might create a corrosion problem.

The big need, they said, is to find a liquid with a very low viscosity that could penetrate the formation in the water zone and gel the water, keeping it from the well bore.

They noted that logging companies now are investigating techniques of pinpointing water zones in advance of air/gas drilling in a given area.

(2) Pipe Stress.

Without the dampening effect obtained with mud in the drill string, shock stresses hit the pipe harder.

And there is no bouyancy of the pipe during trips.

Therefore, the pipe undergoes more stress than with mud in the hole. Bobo and Boudreaux are inclined to think this will have no effect on the economics of air/gas drilling. But they stress that "it should be kept in mind until conclusive evidence is found to show whether this will be a problem or not."

(3) Hole Deviation.

Phillips solved this problem by using an old tool that hasn't been much in vogue recently—the steel-ribbed stabilizer, built up to a collar diameter of ⅛-in. smaller than the bit being used.

Over-all the report concluded that, despite the still-unsolved problems: "The future of air and gas drilling is assured."

"The savings in time and money are almost unbelievable," it went on, and have been proved in certain areas of West Texas, New Mexico, Arkansas, Oklahoma, the Rocky Mountains, and Canada. The successful solutions to locating water and sealing off water zones will open up many more areas to drilling with air or gas and will lead to greater savings for all who take full advantage of this new method of drilling."

(Shamrock Drilling Co. disclosed last week that it has been using natural gas for drilling-in wells in the Wilmington field, Long Beach, Calif., a state in which such drilling is still rare (PW—Oct.4'57,p22). Shamrock reported that its use of gas for drilling-in has shown promising results ever since it was first started, about a year and a

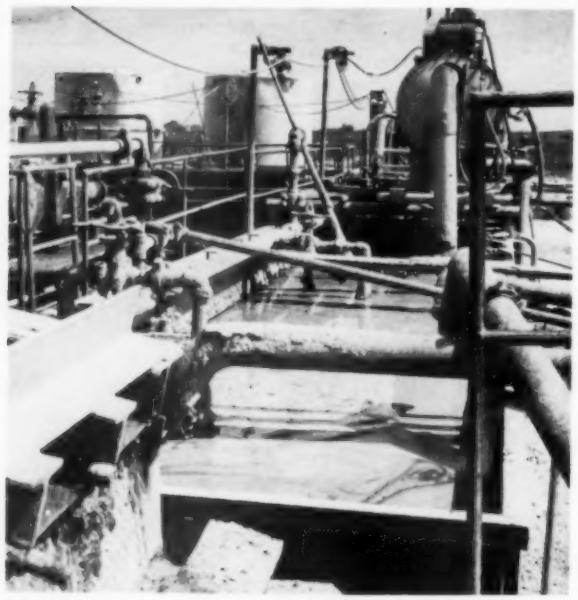
half ago. Gas drilling was tried at Wilmington to combat lost circulation problems found in certain areas of the field.)

The report also emphasized the possibilities of drilling with aerated mud.

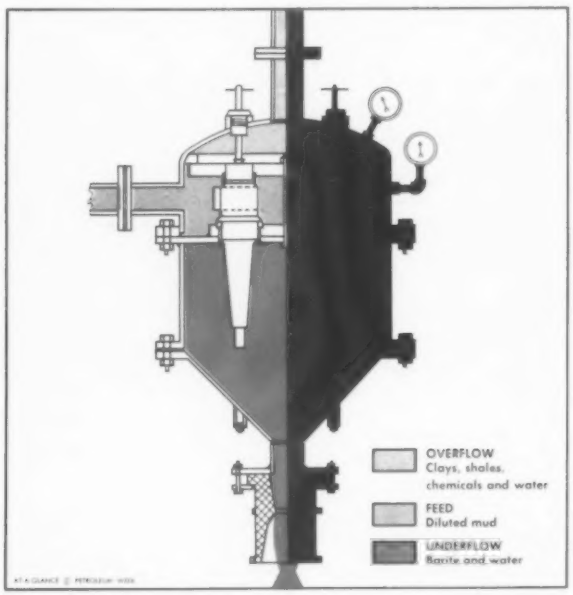
Bobo and Boudreaux brought out these facts:

- Corrosion of the oxygen cell type—extremely damaging to drill pipe, even during one bit run—is a big problem. The problem can be controlled by using such a material as saturated lime water to bring alkalinity up to pH 11, or better.
- One of the "big, unsolved problems of aeration drilling is in prevention of the sloughing of shale." In long shale sections, the sloughing means that the liquid rate must be increased to remove cuttings and falling material from the hole. This, of course, nullifies the benefits of low-pressure drilling.
- Prolific water zones "present as much of a problem to aerated mud as to air or gas drilling, and for the same reasons."

"The future of aerated mud drilling as a method for increasing penetration rate and bit life is dependent upon two developments—solving the problem of sloughing shale and increasing the cutting-carrying capacity of the mixture," Bobo and Boudreaux concluded. But, they added, lightening the mud with air, even in regular mud drilling, can "balance off" severe lost circulation zones by preventing the loss of mud in the zone.



MUD SYSTEM at No. 1 O. W. Killam, Southwest Texas, where a special mud held up temperatures as high as 460F.



CYCLONES, such as this Clayjector, recover barite from mud by means of centrifugal force, causing barite to drop out.

Drilling Fluids Are in the Spotlight

Drilling fluids are getting more attention than ever. One result is that mud materials now exist that can withstand bottom hole temperatures as high as 500F. This can help make possible the drilling of wells much deeper than the present record holder.

This development was definitely confirmed in the recent drilling of the No. 1 O. W. Killam, near Laredo, Webb County, Tex.

The well hit salt prematurely and was temporarily abandoned. But it went to 15,107 ft. total depth through some of the hottest conditions ever recorded in drilling.

Temperatures went as high as a measured 460F. Even under such extreme conditions, the properties of the mud used did not change appreciably.

The well in which the special mud was used experimentally was planned from the start as a problem hole.

Before drilling began, the operator, Ginther, Warren & Ginther, of Houston, the drilling contractor, Dillard and Waltermine, Houston, and Magcobar (Magnet Cove Barium Corp.), which handled the mud program, discussed the expected conditions.

They concluded that temperatures as high as 400F. could be expected by 14,000 ft., that there probably would be high-pressure, low-volume gas, and that there probably would be a lost circulation problem.

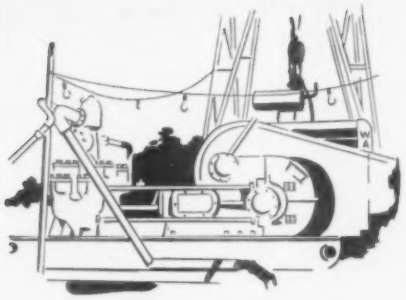
So the mud was especially tailored for the conditions.

A type of mud originally developed by Magnolia Petroleum Co.—a low-sodium nonionic surfactant (surface acting) mud, containing flocculating electrolytes to discourage the hydration and dispersion of clay solids—was decided upon.

This type of mud was used in drilling both the world's

DRILLING WITH J&L SUPPLY

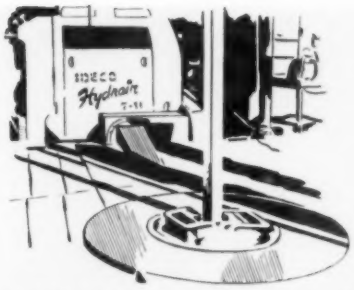
IDECO Full View Mast — meaning that, and more. Everything you get with a standard drilling derrick, but more easily moved in and rigged up. You expect and get important advantages in equipment recommended by J&L Supply.



From 220 to 750 Horsepower there's a rugged Wheland Duplex to fit your rig. Compact, readily portable, faithful as a dog. Quickly accessible — and J&L stands by with 24-hour parts service.

In the derrick? Without hesitation J&L Supply recommends the IDECO Shorty Block, IDECO Streamlined Swivel, Republic Rotary Hose, J&L Wire Line. Four of a kind make a comfortable hand in a game with no limits.

J&L Blue Ribbon Drill Pipe deals a driller the last card in a royal flush. It drills the world's deepest wells — is made to commensurate standards. Internal and external upset. Blue Ribbon Heat-Treated Alloy Steel, or Blue Ribbon plus Vanadium. Upset for grip type, counterbore weld and flashweld tool joint applications.



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30-I

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1929 First bucked-on tool joint with controlled torque — to minimize washouts.

1933 First bucked-on and welded joint — to prevent last engaged thread failures.

1937 First bucked-on and counterbore welded tool joint — to reduce welding cost for the operator.

1938 Introduction of *first unitized drill stem* — after three years of full-scale research into flash-welding process.

1942 Introduction of hardfacing in depth on "Flash-Weld" tool joints — to lengthen the life of joints.

1942 Refinement of flash-welding techniques — to permit use of smaller pipe upsets.

1945 Introduction of copperplat-

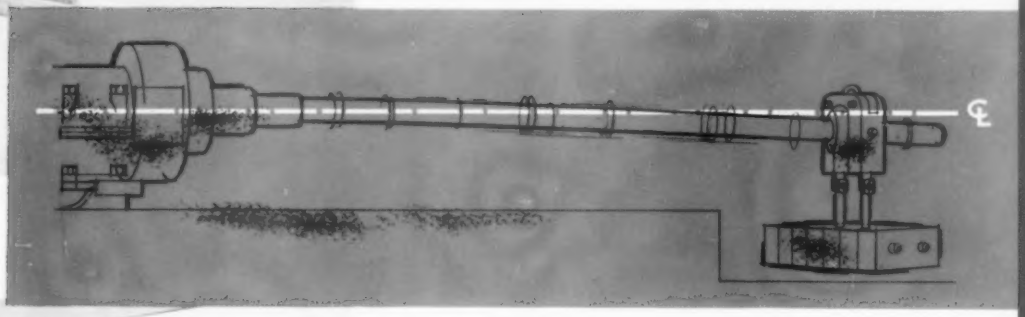
out of CONTROLLED DESTRUCTION comes progress

Three specially designed rotating fatigue machines are kept in operation 'round the year testing drill stem to destruction.

Pioneered by Hughes as early as 1931, the use of fatigue machines has contributed importantly to the advancements made to date.

These machines are now being used in one of the most extensive programs yet undertaken. The purpose: to provide improved tool joint-to-pipe connections to meet the higher stresses of deeper drilling anticipated in the years ahead.

Always out in front, HUGHES' continuing research assures the operator that his drill string — for the *present* and the *future* — will have the most dependable tool joint-to-pipe connections that he can run in the hole.



ing of box and pins — to minimize galling.

1947 Stress-relieving of weld zones in high alloy and all other grades of pipe.

1956 Development of techniques and equipment for cold-rolling large land area of pipe — to strengthen pipe and "Seal-Grip" tool joint assembly.

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Houston, Texas

deepest and second-deepest producers by Richardson and Bass et al, in Louisiana (PW—Sep.20'57,p14).

To increase the fluid's stability in the terriffic heat, Cypan, manufactured by American Cynamid Corp., was included as a fluid loss additive.

To help control the mud further and to minimize filtration loss, Magcobar added a special experimental emulsifier, designated as HS400X.

The net effect of the special mixture was to give a thin cake to the well bore, with low fluid loss during the extremes of heat and pressure.

The drilling followed the planned program. During the first part of the operation, the fluid loss was carried at approximately 5 cc. During the last part, it was controlled beween 3 and 4 cc. (according to the standard 30-min. filtration test).

(As a coincidence, a special plastic funnel developed by Magcobar for use in measuring funnel viscosity of mud was used in the field for the first time on this job. Magcobar engineers said the standard metal funnel would have been too hot to handle.)

As formation gas was encountered during the drilling, the mud weight was increased from 14 lb. per gal. to 17.5 lb. per gal.

At times, the temperature of the mud itself at the flow line measured as high as 179F., while the bottom hole temperature was recorded as high as 460F.

At the time the salt was encountered, the mud had a salt content of about 12,000 parts per million which rose swiftly to saturation, with consequent minor thickening of the mud. Drilling continued with the mud classed as a high-salt-content surfactant type.

But no difficulties were experienced in controlling the properties of the mud while drilling to total depth.

Because of the ideal test conditions, a mobile laboratory constantly monitored drilling fluid performance at the site.

"While the materials had functioned perfectly under laboratory conditions, the well test was absolutely essential," a Magcobar official commented. "We can run the temperatures up and do all the rest of it in the lab, but it's still necessary to see what happens in actual deep drilling conditions."

This was the first severe field test for the experimental emulsifier.

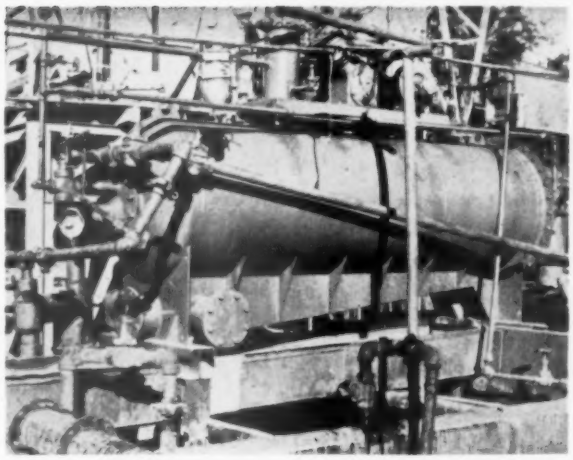
The well proved the value of having the operator, contractor, and service company "working closely together in preplanning and executing a drilling program," Magcobar says.

The mud company concludes: "Since the ingredients were found to be stable under extremely high temperature conditions, there is no reason to believe that the program followed on the No. 10. W. Killam wouldn't be satisfactory for handling bottom hole temperatures as high as 500F."

Use of Flocculants Grows

The drive for the thinnest possible drilling fluid has brought the use of "flocculants" into widespread use during the past year. These agents help break clay particles out of the fluid during drillling. All of the mud companies handle a wide variety of these agents.

When flocculating agents are introduced to water, and the water is circulated in the hole during drilling, muddy fluid returns, and the unwanted clay particles that cause



MUD D-GASSER uses vacuum arrangement to remove gases picked up downhole, giving better control of mud properties.

bit wear tend to clump together until the clumps get so large that they fall to the bottom of the mixture. Then they are separated out.

Normally, clay particles are so fine that it is almost impossible to separate them out of water. Flocculants, by changing the electrical charge that holds these particles apart, and reversing the molecular surface tension of a fluid so that the particles are attracted to each other, cause the fine clay particles to lump together and fall out.

Only a very small amount of flocculant—a hundredth of a pound per barrel of fluid—is needed in drilling. An entire well, therefore, can be drilled for as little as $300 worth of flocculating materials.

Their value was summed up this way by one engineer for an oil company in the Mid-Continent:

"With flocculants we get a very significant increase in bit life, because we get rid of abrasive clay particles. They are particularly valuable where drilling with water is practical."

But, like all other developments, flocculants have limitations. They cannot be used, apparently, in extremely high-pressure areas, where the fluid must be extremely heavy. And they evidently haven't been too successful in "heaving shale" areas.

Mud-Treatment Cuts Costs

The recent completion of Louisiana's second deepest producer highlighted the growing importance of liquid cyclone treatment of weighted muds to save expensive barite weighting materials.

The Richardson & Bass, J. Ray McDermott & Co., Inc., John W. Mecom, and Freeport Oil Co. No. 1 Humble-R. L. Price-LI&E-State Lease 2345, Plaquemines Parish, was completed at 19,190 ft. to produce from the interval 19,153-74 ft., after reaching a total depth of 20,186 ft.

Richardson & Bass used a "Clayjector" cyclone control system extensively in drilling the deep hole. Clayjector is a product of Salt Water Control, Inc.

The hole was first drilled to 18,600 ft. without use of the Clayjector. When a 7-in. liner collapsed in the hole, it was redrilled as a sidetracked hole from 11,900 ft., using the

Clayjector and the same type of lime-base, oil emulsion mud. In both wells, the weight was increased from 16.8 lb. per gal. at 14,000 ft. to 17.6 lb. per gal. at 18,000 ft. So a direct comparsion was possible.

In the interval between 15,000 and 16,000 ft., barite use was decreased by almost 40% between the two holes. But the maximum efficiency of the system occurred in the interval between 16,000 and 18,000 ft., reflecting a reduction in total mud costs of 59%, and in barite usage of more than 66%.

In the interval from 14,000 to 18,000 ft., some $32,569 were saved in mud costs. In the stretch between 16,000 to 18,000 ft. alone, mud cost savings totaled $27,160.

From this and similar field operations, SWACO has determined that barite recovery runs from 75% to 90%, rejection of drilled clays from 50% to 80%, and the savings in barite costs as compared to jetting from 45% to 80%.

Like an air cyclone, the liquid cyclone has no moving parts. Slurry is forced in at the top of a cylindrical-conical chamber. Rapid fluid rotation and the formation of a liquid cyclone with extremely high centrifugal forces causes the heavier, larger particles (barites) to the wall of the cone. The design of the device leads to the discharge of these particles through an apex valve at the bottom.

The lighter, smaller particles and the carrying fluid (the mud is diluted with water before it goes into the cyclone) stay on the inner side of the downward spiral and are pushed upward from the bottom, counter-spiraling to the top, where they are discharged.

Laboratory and field tests have now established proper operating conditions for the cyclone.

SWACO says feed pressure must be 50 to 70 psi.; overflow back pressure, 2 to 4 psi.; feed weight, 9.8 to 10.5 lb. per gal.; overflow weight, 8.6 to 9.2 lb. per gal.; and underflow weight, 18 to 20.5 lb. per gal.

The pressures and feed weight are obtained by use of the system's dilution equipment, and the underflow and overflow weights are adjusted by the apex valve at the bottom of the unit.

The two Richardson & Bass et al deep wells in Louisiana also accented the value of continuous gas removal from the drilling mud.

A SWACO Mud D-Gasser system was also employed on both the earlier, world's record deep well, which went to a total depth of 22,570 ft., and the later one.

The D-Gasser, basically, works on a system of flowing the returned drilling mud through a tank in which a vacuum arrangement removes gaseous hydrocarbons it has picked up downhole.

In the world's record hole, the D-Gasser permitted a tolerance of gas-cutting continuously from below the 9⅝-in. protection string, at 13,656 ft., to total depth. Mud weight could thus be held at only slightly more than the indicated bottom hole pressure encountered as drilling proceeded.

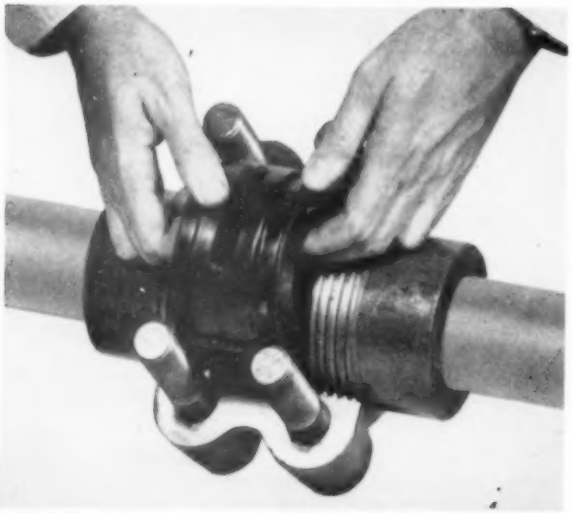
The mud bill for this well was almost $631,000. SWACO says there is no control well for comparison. But based on 1,000 wells drilled with the use of the G-Gasser, the company estimates that the mud bill without the system "might have been more than $1-million—if he well could have been drilled at all."

In the second deep well, a unique method of bringing the well in by cutting the mud from 18.3 lb. per gal. to 16 lb. per gal. was employed. The well simply came in against this diluted mud.

"This procedure would have been extremely difficult had the D-Gasser not been used to remove continuously all volatile gasses from the diluted mud," a SWACO official said.

In addition to the Gulf Coast, the system is coming into use in such areas as southern Oklahoma.

Other Developments Will Also Help



FLEX-SEAL mud valve permits changing of worn parts without moving the subs apart or taking the bonnet cap from the line.

Many other advances on a wide front—all aimed at better, more economical drilling—are also being made. Here are some of them:

In the Rockies, a new type of formation sampler is being used.

A tool to extract core samples during drilling has been developed by Empire Tool Co., of Denver, with cooperation of The California Co. and Continental Oil Co.

Constructed of heat-treated alloy steel, the tool is fitted into the drill string below the drill collars. Any type of full-gauge bit is attached to the lower end of the tool body, permitting normal, conventional drilling.

During regular drilling, a retrievable plug closes a side outlet in the tool.

When a sample is desired, the plug is retrieved by a wire line, either a measuring or sand line, and a sampling assembly is dropped down the drill pipe. The kelly is then reconnected and pumps started.

A moderate volume of drilling fluid causes samples to be cut at an angle of approximately 30 deg. to the axis of the bore hole, about 15 in. above the drill bit.

The bit is forced into the formation, and retracted, by a cylinder that receives pressure from the drilling fluid.

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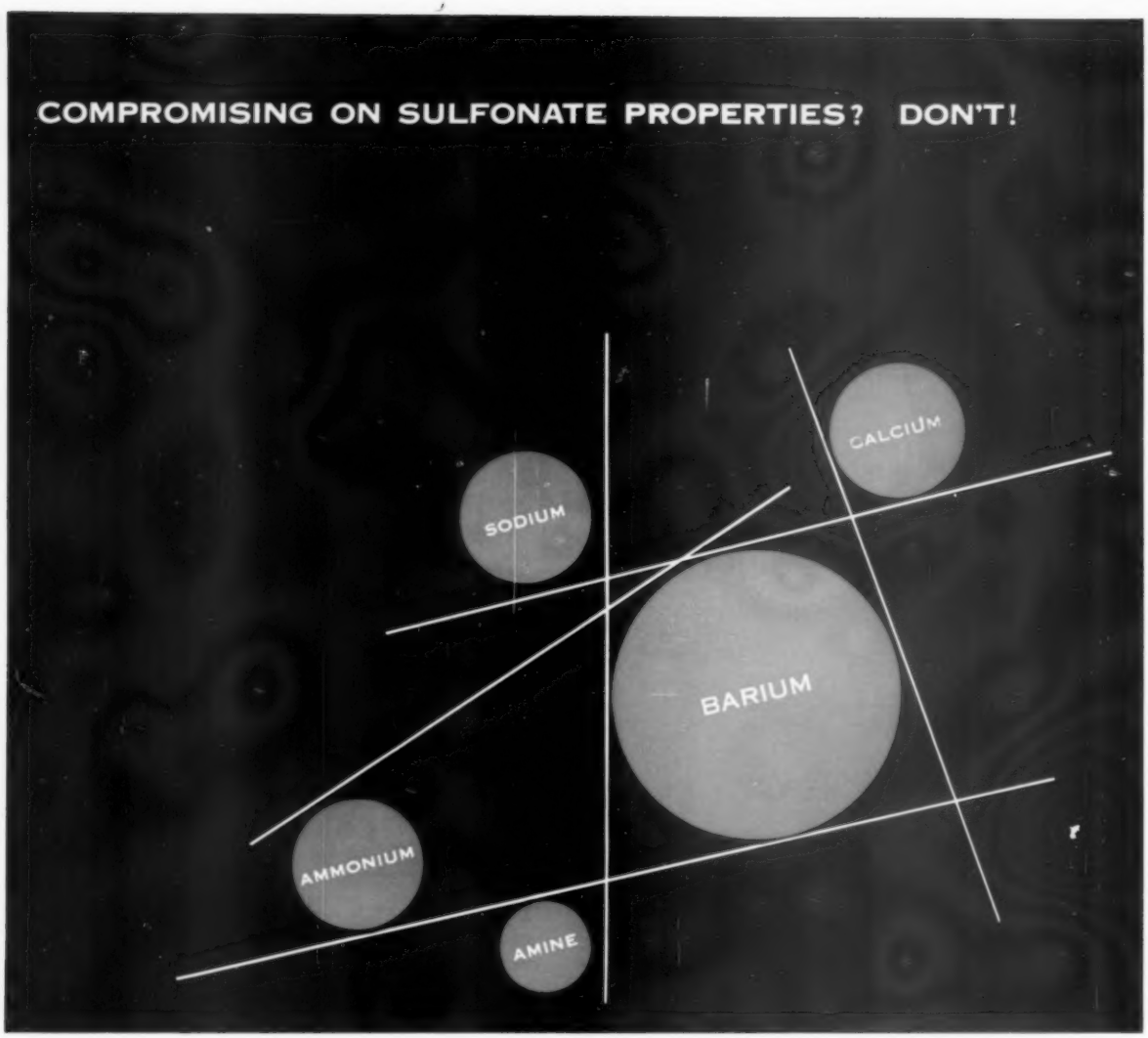

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The flexible sampling tube carries torque and longitudinal forces.

The tool automatically rotates, forcing a sampling cutter into the formation with power furnished by a positive-displacement fluid motor, also driven by the pressure of the drilling fluid.

Cutting time runs from 3 to 16 minutes, depending on the type of formation, sharpness of the sampling bit, etc.

At the conclusion of the cutting cycle, pump pressure falls off about 25%, signaling the driller. The cutter is automatically retracted into the body of the tool.

The sampling assembly then is removed through the drill pipe on the wire line, and normal drilling resumes.

So far, the device has undergone considerable testing and field jobs. An engineer for a major company comments: "It has definite possibilities and, so far, appears to work satisfactorily."

The big value of the tool, if it proves out, is that it causes little interference with normal drilling operations.

Off-bottom testing of formations also is receiving increasing attention.

While off-bottom drillstem testing isn't new, a tool developed by Halliburton Oil Well Cementing Co. is being used successfully to eliminate the need for anchor pipe extending to bottom. This anchor pipe, utilized to take the weight of the drill stem, sometimes sticks because of sloughing formations below the packer, or because of anchor pipe kinking. And it requires rigtime to make up and break out stuck anchor pipe.

Halliburton's "sidewall anchor assembly" is designed to be run below a straddle packer assembly, and provide support for the mechanical weight required to set the packers prior to testing.

The tool consists of six large mechanical-type slips mounted on a wedge-shaped body, a set of open-hole type drag springs, and a J-slot locking mechanism to hold the slips in the unset position while going into the hole.

It is locked by rotating the drill pipe, then lowering it. Raising of the drill pipe releases the mechanism.

One major company has used the tool on more than 25 wells. Says one of the company's petroleum engineers: "After we've reached total depth, we make those off-bottom tests where the logs indicate potential pay zones, before running casing or before abandoning.

"The one limitation is that there must be a pretty competent formation—hard, and without a tendency to crumble. But we've used it in wells in the Denver-Julesburg Basin, Wyoming, Montana, Rangley (Colorado), and the Uinta Basin (Utah), with neither greater nor less misruns than with the conventional test tools."

The use of "automatic drillers" seems to be spreading.

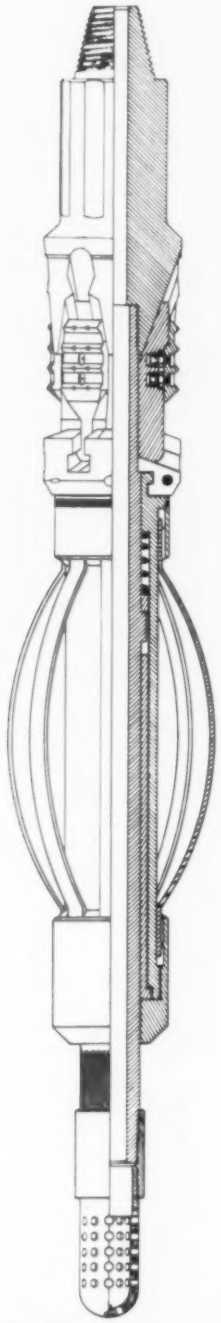
The "automatic driller" helps maintain a constant weight on the bit, keeping it on bottom. Basically, the device operates by means of a "crawler" connecting the drilling cable and the brake lever. It releases the brake when additional weight is needed on the bit, and sets the brake when too much weight begins to be applied—operating according to settings on a control panel.

The devices are available in both electric and air-operated units. One distributor alone, Harris Sales & Rentals, Odessa, has placed units on 75 of the 450 rigs active in the Permian Basin. Another developed by Mud Control Laboratories, Oklahoma City, is being utilized in the Rockies.

Still another, by Brantley Drilling Co., is in field service.

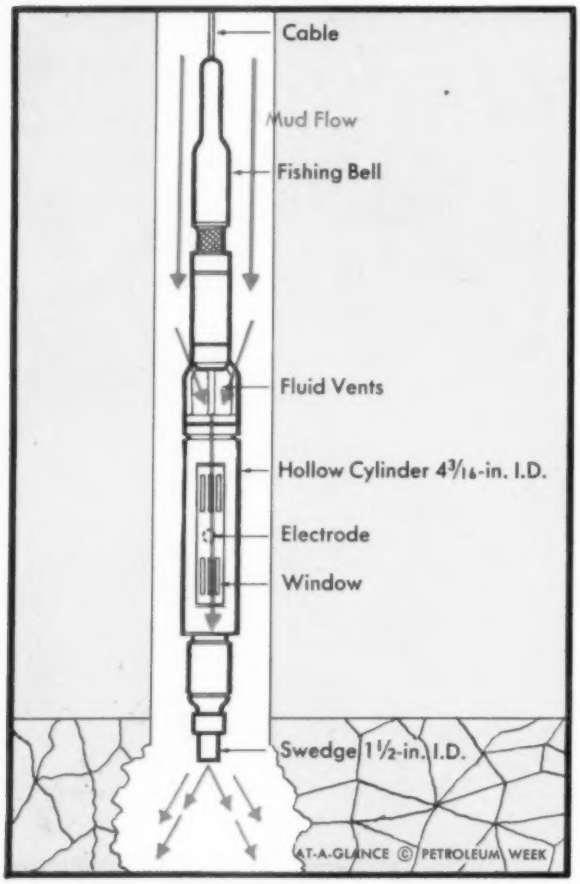
Manufacturers are heeding contractors' demands for

Sidewall Anchor Assembly



AT-A-GLANCE © PETROLEUM WEEK

SIDEWALL ANCHOR ASSEMBLY permits off-bottom testing of formations, eliminates need for running anchor pipe to bottom.



BIMETALLIC LINER for shaped perforating charges minimizes plugging by slugs because zinc outer coat volatizes quickly.

more compact packaging of equipment and are striving for less weight.

The best example of this trend is the recent unveiling of Cardwell Mfg. Co.'s V-1500 Mud Pump (PW—Sep. 27'57,p30).

Another of the more pronounced indications is the constantly-progressing unitization of rigs.

At the same time, this smaller-packaging trend has brought on some problems. For example, there isn't the old roominess in mud lines on a unitized rig, so that repairing of valves has been difficult.

In this instance, manufacturers are redesigning equipment. Cameron Iron Works, for instance, has come out with the "Type R" Flex-Seal mud valve, which permits the changing of wear rings and gate packer without moving the subs apart or taking the bonnet cap from the line.

The "bimetallic" liner for shaped perforating changes evidently is helping to eliminate or minimize the plugging of perforated holes by slugs or "carrots" from the charge.

Copper is the common material used as the conical liner in the shaped charge used for perforating wells, because of its excellent characteristics of plasticity and density.

However, as the charge explodes and squeezes in the cone, a slug of copper frequently follows the explosive into the perforation blasted into the formation. This can restrict the flow of fluid through the perforation into the well bore.

J. Delacour, Society de Prospecting Electrique, M. P. Lebourg, Schlumberger Well Surveying Corp., and T. W. Bell, also of Schlumberger, reported this week at the Dallas meeting of the Society of Petroleum Engineers, AIME, on the results of field-firing some 360,000 "bimetallic" liner charges designed to eliminate such plugging.

The "bimetallic" liner consists of an inner core of copper and an outer cone of zinc. Laboratory tests indicate that the same striking power is achieved, with the zinc volatilizing so rapidly that no slug is formed.

The report said that with the "bimetallic" liner, "the slug is effectively eliminated in the jet process," which "greatly enhances the performance and efficiency of the individual perforation."

One of the answers to pinpointing a lost circulation zone is a wire line detector tool, which is designed to find the zone within a foot. Developed by Gulf Research & Development Co., and licensed to Schlumberger Well Surveying Corp., the detector operates on this principle:

Inside a "window" of slits in the center of the tool is a rubber diaphragm, which moves in or out, depending on the inside vs. outside pressure. The diaphragm moves outward as drilling mud flows through the cylinder downward.

An electrode is located in the center of the diaphragm between two fixed electrodes on either side of it. Current flows between the fixed electrodes and is recorded on the diaphragm electrode and at the surface.

When lost circulation occurs, readings are taken with the instrument every thousand feet or so below the surface casing until a reading reveals there is no flow through the detector.

This means the "thief zone" is above that point. The method then becomes one of "bracketing" the zone by moving up and down the hole until the exact spot is located. One of the lost circulation characteristics revealed through use of the detector, Schlumberger says, is that such zones are commonly quite thin—usually only a foot or so. On the average, the company adds, the survey requires only an hour or so, excluding set-up time.

In cementing, a new accelerator is now being used extensively.

According to Halliburton Oil Well Cementing Co., the newly-developed "HA-5" accelerator can cut waiting-on-cement time by as much as 50%.

In fact, the company says, field tests (there have been more than 150, so far) have shown that it is possible to cement in the morning, perforate in the afternoon, and fracture the next day.

It is particularly useful on surface pipe and shallow-hole jobs. While not recommended for use below 2,000 ft., it has been used by at least one operator in placing five stages of cement within a 12-hour period at 3,000 ft.

Halliburton says WOC time can be as short as four hours at temperature of 80F.

The company's chemists report that HA-5's effectiveness seems to vary with different brands of cement, and the company now is evaluating the accelerator's performance with sample batches from various plants.

Another cement development that shows promise is a latex-cement, which has given good results where regular portland cement did not work well.

A survey of nearly 1,000 wells shows that "Cealment,"

developed by Dowell, Inc., seems to do the necessary job.

The building trades industry has used latex-cement widely for many years. But it has been used in oil-well cementing for only about two years. Dowell is not the only company to offer a latex-cement. But its survey is the first comprehensive report on how the product has performed in a variety of uses in a large number of wells.

The survey covers 957 Cealment jobs in seven company operating areas, and includes 86% of all the latex-cement jobs Dowell did in the U. S. between July 1, 1956, and July 1, 1957.

Here is how the Cealment success ratio stacked up:

- Squeeze jobs: Of 389 such jobs, 257 were "completely successful," and 27 were partially successful. There were 105 unsuccessful attempts, for an over-all success ratio of 66.1%.
- Tail-in jobs: Of 273 operations, 255 were a success, 5 were partially successful, and 13 were unsuccessful, for a success ratio of 93.4%.
- Liner jobs: Of 30 done, 27 were successful, and 3 failed, giving a 90% success ratio.
- Plug-back jobs: Of 143, 89 were successful, 10 partially successful, and 44 unsuccessful, for a success ratio of 62.3%.
- Primary cementing: Of 23 jobs, 22 were successful, giving a success ratio of 95.5%.
- Lost circulation: Of 9 performed, 7 were successful, for a success ratio of 77.8%.

Though Cealment latex-cement costs about three times as much as ordinary portland cement, it has many compensating advantages, Dowell says. Among them:

- Latex-cement does not shrink when set under pressure.
- It has superior bonding strength between the formation and the casing, whether in oil or in water.
- It has greater resiliency, resists shattering when perforated, and affords little danger of water intrusion from below, or gas from above.
- Low fluid loss permits low water content, which virtually eliminates the dangers of incomplete shutoff due to shrinkage, and of flash-setting because of dehydration.
- It is durable. Latex-cement can be made to offer extra resistance to sulfate brines without sloughing off.
- It resists contamination, assures better resistance to any acid or other well fluids that may be introduced later into a perforated zone.

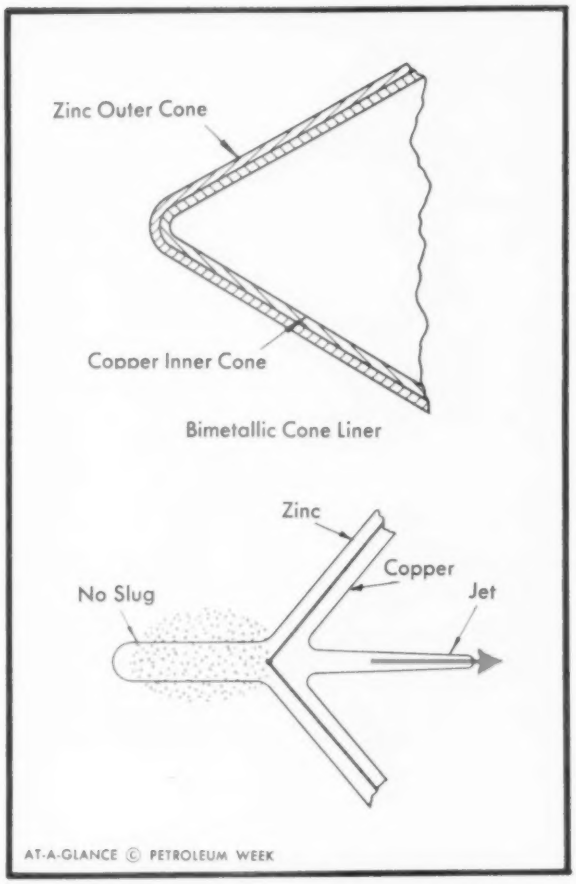
It is believed that many of the failures that did occur in the use of Cealment can be eliminated through further development and experience.

A Dowell official says development of better mixing and handling equipment, and improved service generally, will hold failures of Cealment squeeze jobs below 25%.

The survey showed that the 105 failures (26.1%) that occurred in the squeeze jobs were due to several causes. Among these were (1) three equipment failures; (2) five flash-setting occurrences; (3) 14 failures of the material to set due to migrating water; and (4) six jobs in which other conditions were beyond Dowell's control.

The survey notes that all the squeeze jobs reported were single-stage applications to shut off water or gas, abandon a zone, repair a casing hole, repair the primary cement job, or to accomplish other remedial cement squeeze work.

All of these squeeze jobs involved displacing the material, forcing it into the desired position with pressure. Most of the Dowell latex-cement jobs were done in zones that were difficult to squeeze with other materials.



LOST-CIRCULATION DETECTOR can spot "thief zones" with high accuracy, but fluid must be electrically conductive.

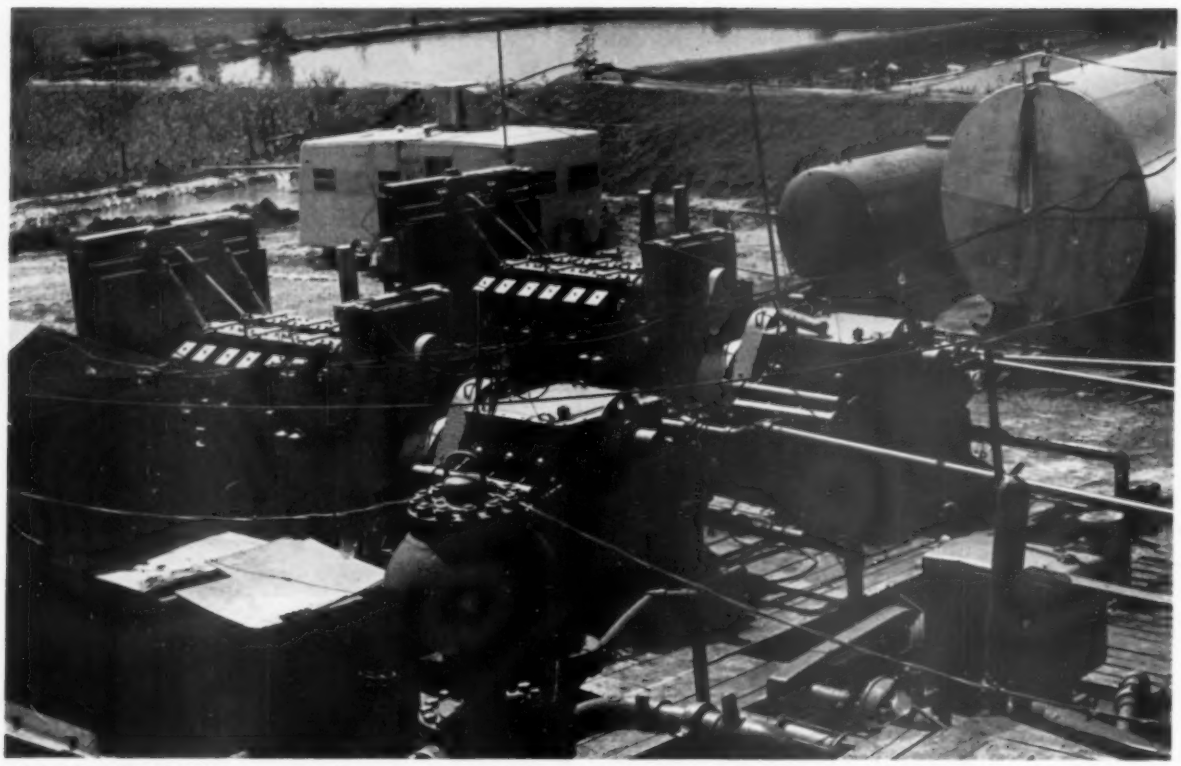
About 95% of the tail-in work was done in areas that have serious communication problems between closely-spaced zones while perforating, fracturing, and acidizing, Dowell reports.

The tail-in jobs covered in the survey were those in which portland cement was followed by latex-cement, the latter being the last to be displaced. These jobs were done (1) to insure a good cement job around the shoe (unless a shoe failure occurs, there is no other method of evaluating the success of this type of application), and (2) to prevent communication between closely-spaced zones.

One operator in Stonewall County, West Texas, reported to Dowell:

"The Canyon sand in the Flowers field has three to five sections of low permeability. The sections have good oil saturation, but wells have to be fractured to make commercial producers. The method used to fracture has been to perforate all sections, using temporary plugging agents to divert frac to each zone. We were not sure of what was happening, or of any control to the amount of fluid to each zone.

"Tailing-in with Dowell's latex-cement, covering the producing sections, and using straddle packers to isolate each zone, has been successful in ending the communication trouble in the 15 or 20 jobs done."



UNIQUE MUD PUMP set-up contributed to new depth record set by Magnolia No. 1 Sterba in Caddo County, Okla. Engines for plunger-type mud pump can be seen to upper left and left center; old mud pump is in foreground.

Deep Drilling Records Are Toppled

Deep drilling records are continuing to topple around the oil patch, emphasizing the strong trend toward overall deeper holes. The current record-holder in Texas is now below 20,848 ft. But another is projected to 22,000 ft.

Already, Pan American Petroleum Corp. No. 1-CS University, 15 mi. southeast of Ft. Stockton, is the deepest ever drilled in the state.

At the latest word, it still hadn't reached the Devonian, but its projected depth is 21,000 ft.

Meanwhile, Phillips Petroleum Co. and Sinclair Oil & Gas Co. No. 1-A Montgomery, in Pecos County, is scheduled for 22,000 ft. This week, it was below 6,877 ft.

Oklahoma also has a new record-setter—a 20,426-ft. geological wildcat in the Cement field of Caddo County.

Magnolia Petroleum Co. No. 1 Sterba fell short of reaching its objective—the Ordovician. Nevertheless, it did beat the old drilling depth record by 2,268 ft.

But while the project failed to reach its objective, it was a ringing success in nearly every other aspect. Most outstanding is the fact that not one hour of drilling time was lost to fishing jobs—the bogey of all deep holes. The operators and the contractor—Big Chief Drilling Co., of Oklahoma City—agree that long and careful planning, thoughtful preparation, watchful drilling, and close cooperation added much to the success of the venture (PW—Oct.4'57,p11).

Meanwhile, British American Oil Co. No. 1 Krieger, in Stephens County, has cracked Oklahoma's deepest-producer record. The well, in the Oil Creek formation at 16,526-46 ft., flowed at the rate of 6.2-million cu. ft. of gas daily through 3/16-in. choke on test. This well, which actually went to a total depth of 17,484 ft., is producing from 901 ft. deeper than the state's previous record—British American No. 1 Reed, Grady County.

In addition to going constantly deeper, wells are also getting higher. One, in Park County, Wyo., was recently spudded in on a location 10,796 ft. above sea level.

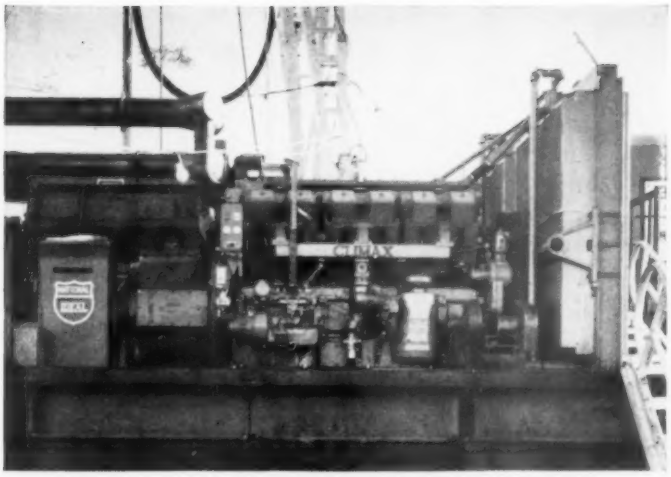
Richfield Oil Corp. believes its No. 1 Carter Mountain Unit, about 30 mi. west of Meeteetse, is the highest well ever drilled in the Western Hemisphere.

It promises to be quite a project in a lot of ways. Richfield spent more than six months this year preparing the site. An estimated $100,000 went into road-building alone.

Troubled by volcanic formations of granite-like hardness, and by continuing lost circulation troubles, the operator made only 1,500 ft. of hole during the first month of drilling.

This first hole finally was cemented and redrilled to 17½-in. diameter.

The well is projected to the Madison formation, which produces from around 8,000 to 9,000 ft. in northwestern Wyoming. But, as John Wiese, Richfield division geologist



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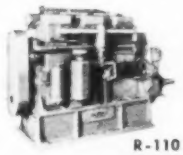
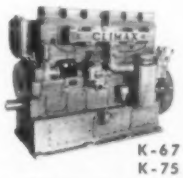
Model	No. of Cyls.	Bore and Stroke	Cu. In. Displ.	Pump and Drilling (Continuous Duty)						Hoisting (Intermittent Duty)						
			(2)	600	700	800	900	1000	1100	600	700	800	900	1000	1100	1200
R-110	4	6⅛x7	824	52	62	71	79	86	91	59	70	80	88	96	103	108
R-165	6	6⅛x7	1238	81	93	105	117	127	135	91	105	117	131	143	152	160
K-67	6	7x7	1616	110	129	145	161	176	188	124	145	164	181	197	212	225
K-75	6	7½x7	1855	126	146	166	185	204	218	142	166	187	209	230	245	260
V-80	8	7x7	2155	140	165	188	210	230	246	158	185	211	236	258	277	289
V-85	8	7½x7	2474	164	194	223	246	266	284	184	219	250	278	300	318	333
V-122	12	7x7	3232	217	258	293	324	353	378	244	290	330	364	398	426	442
V-125	12	7½x7	3711	242	292	340	384	417	442	272	328	383	432	469	498	520

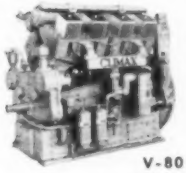
(1) These are continuous duty ratings on standard units that include a radiator and fan.
(2) R.P.M.



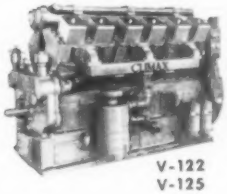
R-110
R-165



K-67
K-75



V-80
V-85



V-122
V-125

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4. All cylinder blocks are provided with renewable sleeves (except R series).
5. All cylinder blocks are cast separate from the crankcase.
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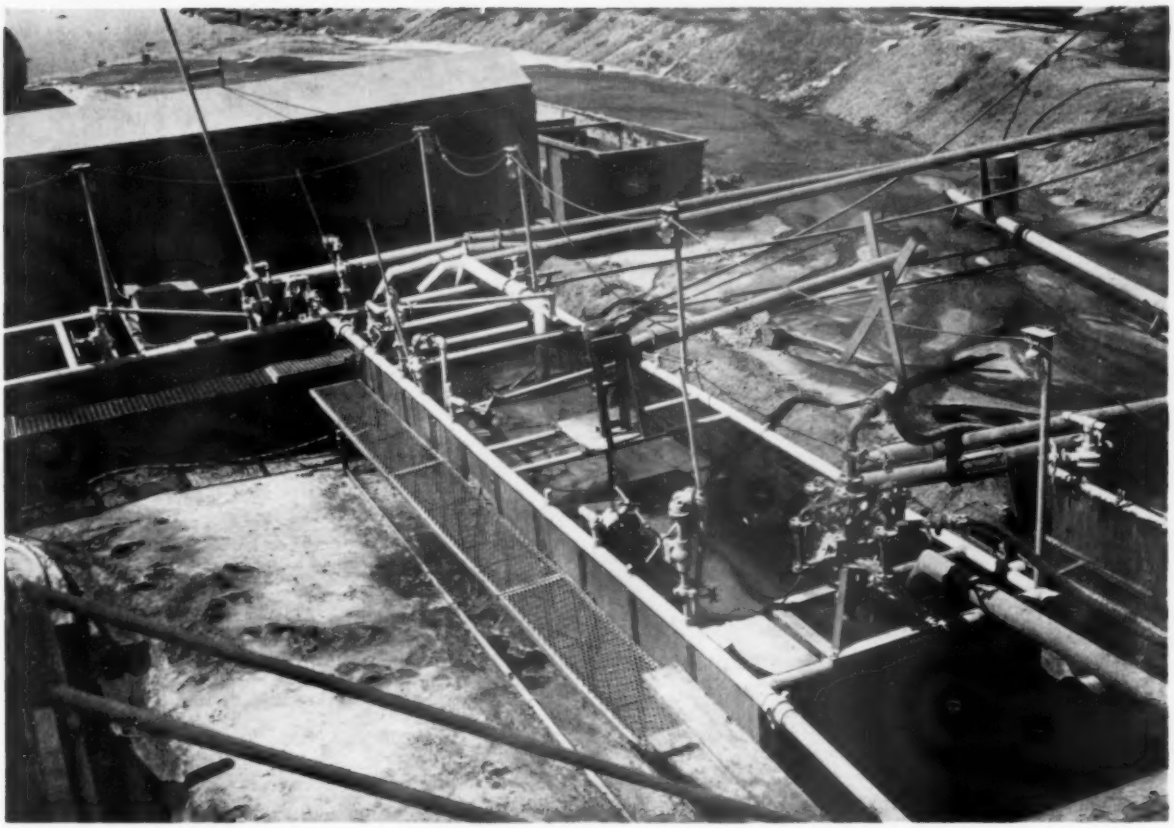

MUD TANK at Magnolia No. 1 Sterba. A 15.2-lb. mud weight was being carried, with about 3,000 lb. pressure, when the hole went below 20,000 ft. The mud program was given large credit for the fact no time was lost for fishing jobs.

puts it, "Those other fields do not have some 6,000 ft. of volcanic residue piled on top of them." The well is expected to go about 9,000 ft.

Dick Murray, Richfield's area production superintendent, is in charge of drilling, which is being done by Will I. Lewis Drilling Co. Murray says preparation has been made for drilling during severe winter conditions. However, he added, a complete freeze-up of available water supplies could halt operations until spring.

And in Canada, a well on a location 8,134 ft. above sea level has become a prolific gas producer.

The No. 3-A Savanna Creek, in the Savanna Creek gas area, some 60 mi. southwest of Calgary, has become the "top" well in Canada.

Located 8,134 ft. above sea level in the Canadian Rockies, the well not only is the highest ever drilled in the country, but appears to be the biggest producer so far in the Savanna Creek area.

Gas flow was measured at the rate of 10.6-million cu. ft. a day on drill stem test at the interval 9,480-613 ft. in the Rundle formation. The well is located on a 78,080-acre block of Crown lands held principally by Canadian Husky Oil Co., Ltd., and Northern Natural Gas Producing Co.

A possible record of another sort—and not a very welcome one—apparently has been set on a Canadian well. A total of 593 bits was used to drill to 12,631 ft.

"I would hate to think that anyone had to use more bits," said a company spokesman, who pointed out that about 15 bits was par for the course.

Spudded in in January, 1956, the No. 1 Grizzly Valley, in the Monkman Pass area, approximately 100 mi. south of Ft. St. John, had reached 12,631 ft. by early September.

Drilled jointly by Richfield and French Petroleum Co. of Canada, on a farmout from Peace River Petroleum Co., the well began acting up in July, 1956, when the drill pipe struck at 7,895 ft. The first fishing operation was abandoned in October, 1956, and the well was sidetracked, with drilling resumed at 7,559 ft.

In May, 1957, the well began to make gas at 11,918 ft., blowing out considerable amount of mud, with the situation continuing almost until mid-June. By late July, when the depth had reached 12,631 ft., the well suddenly started blowing again at a controlled rate of approximately 6-million to 7-million cu. ft. a day.

Finally regaining circulation, the operator lost 3,269 ft. of fish in the hole in mid-August—31 stands and 1 single of drill pipe, 15 drill collars, subs, and bit. Circulation again was lost. A hole was discovered in the 9⅝-in. surface casing, necessitating the running of 7-in. casing inside it (7-in. casing previously had been run below the 9⅝-in. to 11,918 ft.).

Fishing operations were continuing in late September, with 1,033 ft. of the fish having been recovered.

The Big Question: What's Ahead?

Nobody is quite sure just what is going to happen to drilling activity the rest of this year and next year. It depends a whole lot on where you're looking. But there is a considerable amount of gloom.

A typical reaction in most areas is the sardonic comment of one Texas drilling contractor:

"If you're going to write anything about the drilling business, you'd better drape it with some black crepe and lilies."

He says he is bidding on jobs at rates that even operators concede are too low. But he adds: "You have to. You know the other bids are going to be that low."

For the first time in his experience, he says, an operator has asked him to furnish, with his bid, a financial statement, and an affidavit showing that his labor force has been paid.

Another indication of the situation, he says, is that he drilled a recent well for 50¢ per ft. less than he had charged for a similar well in the same field not long ago.

"You've got to stay in the picture," he explains. "You can't let all your people go."

"The main underlying trouble," he concludes, "is that the industry is producing more oil world-wide than we can use. Everything else is symptomatic."

One statistician figures that the 1957 drilling rate may fall as much as 10% below predictions.

Some predictions for this year had been as high as 250-million ft. Instead, he figures, it might be as low as 225-million ft. (compared to the 238-million ft., approximately, drilled during 1956).

"No one really foresaw this bad a situation, that I know of," he says. "It really started after last year's steel strike. The drilling pace did not rebound in the fourth quarter. It was a forerunner—but nobody really believed it was going to happen."

The reasons for the drilling slump are both obvious and subtle. It is plain what they are, but the actual effect of each is much more hazy.

The reasons for the slump cited by most experts boil down to these:

(1) Tight money and low allowables. These have hit the independent operator—the segment of the industry most responsible for a high or low drilling rate—hard. The independent is having trouble getting as much financial assistance as he wants for wildcatting, particularly.

(2) Imports. Regardless of the arguments for and against imports, there is no question but that each barrel of oil brought in from foreign sources is one barrel less that is produced domestically.

(3) Price. With constantly accelerating costs for materials, labor, etc., the price of crude may not be a sufficient incentive for the constantly tougher job of finding U. S. oil.

(4) Expenditures abroad. There is no question that an increasing amount of "oil capital" is going overseas. Ports such as Houston are doing a booming business in rig shipments, for example. New leases abroad are becoming more costly. Every dollar tagged for foreign development is a dollar less for domestic drilling.

(5) Legislative uncertainty over such items as the gas bill and percentage depletion, and harassing congressional probes.

On the other hand, world uncertainty, and such developments as the Suez crisis, failed to help domestic development as much as some had expected.

Just how much each of these factors have affected the domestic drilling picture, and how much change in them it would take to reverse the slump, are questions no one can answer.

The Picture State-by-State

In Montana, drilling is at its lowest point in recent years.

About the only noteworthy success this year, so far, has been Amerada Petroleum Co.'s Silurian wells in the Outlook area of Sheridan County, with their high productive potentialities.

As a matter of fact, the eastern part of the state has been the successful part all along. Big plays elsewhere in the state during the past 36 months simply haven't paid off.

For the state as a whole, one observer comments: "The outlook is not good unless some major discoveries are found in the balance of 1957."

Major companies, generally, seem to be cutting spending in the area, and have no big programs planned for 1958. Rigs are being moved to "greener pastures," and some employees are being laid off.

The money problem shows up in Montana perhaps more clearly than in any other single section.

Budgets, to begin with, usually are tighter than elsewhere. While, geologically and geophysically, the area is eminently promising, not enough dollars have been recovered for the number spent. Unlike the very expensive offshore, Montana hasn't turned up the physical evidence to back up the preliminary promise.

Reports of huge expenditures offshore and abroad make for a very large sore spot among the drilling personnel in the area. But unless the picture changes radically, Montana apparently will remain pretty much in a "limbo" for the next year, at least.

The outlook in Oklahoma registers something between "hopeful" and "maybe." Best bet: The drilling rate should hold steady for the remainder of the year, with possibly a slight upturn by the first of next year.

From some angles, the oil business has never been better in the state—discoveries, new fields to develop, new prospects outlined and leased, etc.

In the Panhandle, the discovery ratio, for example, is nearly 50%.

There are more active operations below 10,000 ft. now than at any time in the past several years. The deep Knox play on the Grady-Stephens County line is accounting for much of this activity, but there are other, similar areas elsewhere.

On the other hand, developmental drilling in the central part of the state is slowing up.

And low allowables are slowing developmental drilling even more—particularly for the independent who concentrates on farmouts around the edges of known structures.

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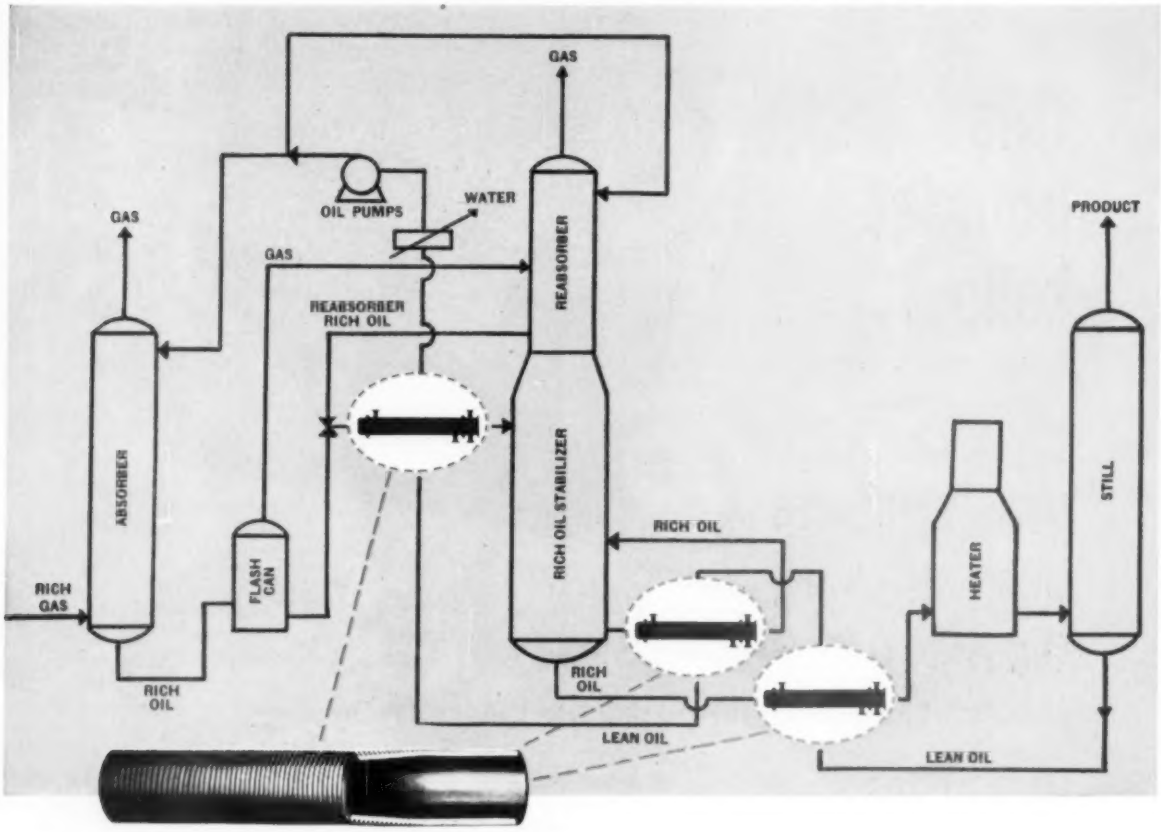

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well deals are now shrinking down to one-well propositions.

Feeling the pinch the worst among contractors are those with the smaller rigs, with capacities from 3,000 to 6,000 ft.

In California, the drilling outlook is bleak. Most people on the West Coast see no improvement in sight for 1958.

The number of wells drilled so far in 1957—1,581—compares favorably with the total for the same period last year, 1,572. Nevertheless, only 55% to 60% of the rigs available are working at any one time.

A spot check of 251 contract rigs in California showed only 145 working, compared with 146 out of 248 last year, and 188 out of 255 two years ago.

If any independents or majors have any big drilling plans for the West Coast, they aren't publicizing them.

One contractor, with two paid-for rigs, says bitterly, "The cut-rate boys never seem to get enough work to get out of the way so the rest of us can make some money. Every time it looks like you can get a decent contract, someone cuts you out of it."

A six-rig contractor: "We don't have a single bid request on hand. We heard an operator was going to deepen a well at McKittrick. They were around getting some quotations, and that was the last we heard of it."

A contractor with four large rigs: "We've had only one bid request in the last two weeks. I don't see any chance for improvement unless somebody makes a good discovery."

On the other side of the fence, a drilling superintendent for a major company complains: "We can't get any money to spend. The company figures it can get more return in places like Canada."

Even the activity in Canada has been disappointing to those who looked for a boom year there.

During early September, the rig-active count stood at 237 in Western Canada, compared to almost 300 in the comparable period of 1956.

The Canadian Petroleum Assn. points out, however, that Western Canada's oil production will be expanding faster than its markets for the next 1½ years at least.

Seeking a more favorable taxation policy for the Dominion's petroleum industry, the association says that the production potential now is "considerably greater" than the current daily production of around 535,000 b/d.

But things aren't black everywhere. Some spots are relatively bright—the Texas and Oklahoma Panhandles, Four Corners, offshore, and North Dakota, for example.

An observer in North Dakota reports that "a rig cannot be hired here." There are 40 rigs now running, where there were only 22 three months ago. The activity apparently springs largely from the Midale pay discovery in the Lignite field by Northwest Oil Co. No. 1 Bunting (PW—Aug.2'57,p29). Seven rigs are now busy in that corner.

Says Paul Lewis, president of the North Dakota Oil & Gas Assn.; "We definitely have an upswing in rig activity that will prevail through the winter. I expect to see it continue. Only an extremely severe winter with many blizzards could slow it down."

In the Rockies, contractors aren't crying the blues. They feel that 1957 will stack up as just about an average drilling year.

Will I. Lewis, AAODC Rocky Mountain vice-president, pretty well sums it up:

"It doesn't look like there'll be any acceleration over the present rate of drilling. But neither should it fall off much. A possibility is that less money may be available early next year for drilling because of allowable cutbacks in places like Texas and Oklahoma. That could affect us in the Rockies."

JACK H. ABERNATHY, AAODC president, says history shows drilling is cyclical, so current slump may last 4-5 years more.

Also on the optimistic side is F. M. Stevenson, Signal Drilling Co., who comments, "We'll be busy for the rest of the year, and we've had several inquiries for early next year."

In Texas, it looks as though the footage rate will about equal the 1956 total, while the number of wells probably will be less.

In a recent report, the Texas Mid-Continent Oil & Gas Assn. said that 12,852 wells, totaling 54,339,534 ft. of hole, were drilled in the state during the first seven months of 1957—compared to 13,096 wells and 54,341,555 ft. during the same period in 1956.

The association pointed to the increasing number of deeper wells being drilled as the reason, predicting that drilling expenditures on the whole should reach the $1-billion mark this year, about the same as in 1955 and 1956.

In the Permian Basin, "there is no end in sight" for drilling. But the activity evidently will gradually move south and west. And a deeper drilling trend has set in.

Most West Texas oil men see in the southern edge of the basin—in the Val Verde and Sheffield Channel areas—a sleeping oil giant. The extremely deep Delaware Basin to the west is another area of great potential.

"The time it will require to explore the Permian Basin thoroughly for all of its oil deposits depends on a lot of factors," says the exploration manager for one major. "But I'll say one thing—right now we're a long way from it, at least 20 or 30 years."

As deep drilling increases—and there is already an emphasis on it in some of the older shallow fields—experts don't look for a sudden boom. They feel it will be a long, drawn-out process, because deep drilling is tedious and costly.

"It's a big country, and it costs plenty to explore it,"

comments one exploration official. "When it costs around $3,000 per day to drill and, on some days, only a half a foot or so of hole is made, it gets rough."

As an example, Shell Oil Co. sank more than $1.2-million in its No. 1-17-A University, a Delaware Basin wildcat in Winkler County, and found only some promising shows in the Devonian 17,410 ft. down.

One of the biggest deep exploratory programs going in the country today is in the Sheffield Channel area, mostly in Pecos County.

Some dozen wildcats are drilling below the 11,000-ft. mark. It's in this area that the state depth record—now below 21,000 ft.—was set, and the 22,000 ft. test is projected (page 62).

In the Southeast, drilling has held up better than in most sections of the country.

The big reason, of course, is a continued heavy drilling rate in the prolific South Louisiana area, including the marshlands.

But the Rodessa production at Citronelle, a recent noncommercial oil show in the Smackover lime formation during a Humble Oil & Refining Co. 15,350-ft. Clarke Country test, and a successful well in the Hosston (Travis Peak) in Misissippi—all have combined to spark the drilling of a dozen or so wildcats in Alabama and Mississippi.

Additional wildcats are expected in Mobile, Washington, and Clarke Counties, and perhaps in Baldwin County, in Alabama, with the Hosston as the primary objective. In the northwest part of the state, activity will continue at about the same steady pace in the Warrior Basin, which contains Marion County's Hamilton gas field.

While there is no tangible evidence of it, yet, there is a good possibility that the laying of the Coastal Transmission Co. gas line from Texas to Florida could bring on an intensified exploratory drilling program in the Florida Panhandle, as well as in Alabama and Mississippi.

Over the long haul, the drilling industry is optimistic.

Jack H. Abernathy, president of the American Assn. of Oilwell Drilling Contractors, sees the history of the first eight months of 1957 as a clear indication that drilling is highly sensitive to developments in other segments of the oil industry.

"Our branch is a barometer of industry atmospheric conditions, which this year have been pressured by problems of price, imported oil, bad weather, tight money, and government probes," he says. But he sees such factors as the traditional autumn upswing and the presidential action on imports as heralding "a possibility that the year's total wells drilled will be near or equal to last year's 58,200 mark."

He recalls that the AAODC prediction of 1957 drilling activity was less optimistic than many, and such a final total would mean that 1957 would just about be in line with the group's January forecast.

Looking farther down the road, Abernathy comments: "A historical review of the drilling industry shows that it is cyclical in nature. Crests and valleys of activity seem to occur on a 4-to-7-year cycle.

"It is possible that the record drilling activity of 1956 reflected a crest, and that the next four or five years will continue to be periods of difficulty similar to the first six months of 1957."

Most drilling contractors are inclined to go along with his opinion that, despite such a grim picture, "Contractors who genuinely work hard at their business will find sufficient profitable work to keep their doors open."

They will, however, be faced with the problem of securing adequate funds for expansion, upgrading rigs, or for going into heavier-duty, deeper drilling, he cautions. (Much the same view was sounded by Walter H. Helmerich III, of Helmerich & Payne, in a report to the Oil Analysts Club of New York two weeks ago. Said Helmerich, "The drilling industry is sick, but we're making money." He said this is largely due to the firm's strict cost accounting. "We can take advantage of every cost saving because we know what everything costs," he added.

(Though his company is making money, Helmerich said, the profit margin is nowhere near what is should be. If the profit margin could be increased, he said, much-needed research by the drilling industry could be stepped up. He said he expected the drilling slump to continue through 1958, but emphasized his belief in the long-range potential of the drilling industry.)

Based on an attrition rate of 150 rigs per year, Abernathy estimates that rig shortages will begin to show up when activity again approaches the 3,000-rigs-active level. If that is too long delayed, he warns, it might be difficult to achieve a fast step-up in rig activity in an emergency.

He also predicts that contractors will reach a "saturation" point in foreign operations "within a year or so, just as the industry met customers' demands for offshore equipment in about 2 to 2½ years."

Adds AAODC Executive Vice-President Brad Mills: "a nervousness over the imports situation and a tendency to reduce crude purchases in the U. S. have combined to create a doubtful situation."

And 1958, he continues, "looks as if it holds serious difficulties for the contractor unless adjustments are made in the imports situation, and in the attitude of large producing companies that should be increasing their reserves. Unless we can get a better balance of imports, I believe we are in for a rough time next year."

But over-all, Mills points out, "Without doubt, extensive drilling must continue, both from the exploration and the proven-field standpoints. The reported availability of crude oil in the U. S. over the present production rate appears to be greatly exaggerated when transportation facilities are considered."

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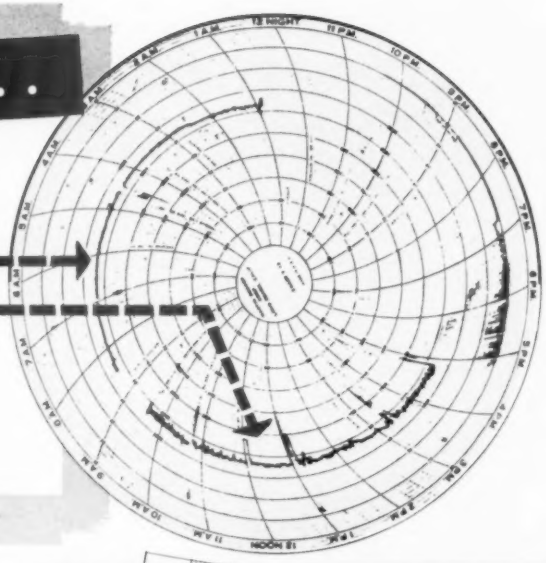

RATE of PENETRATION GRAPH

on offset locations--Same Rig

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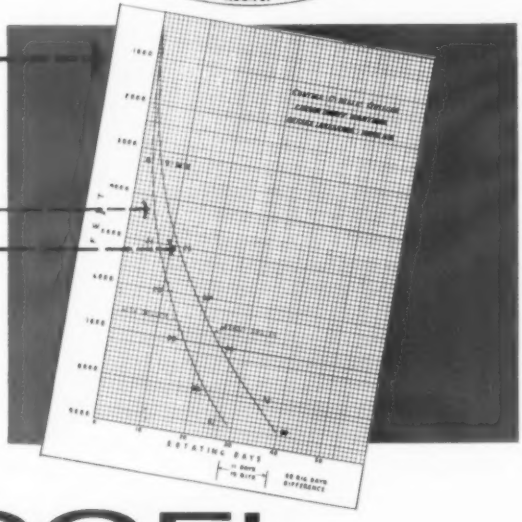

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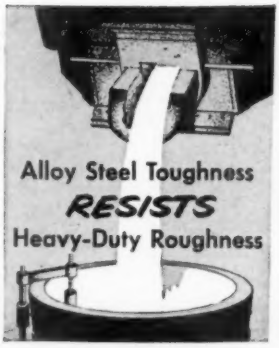

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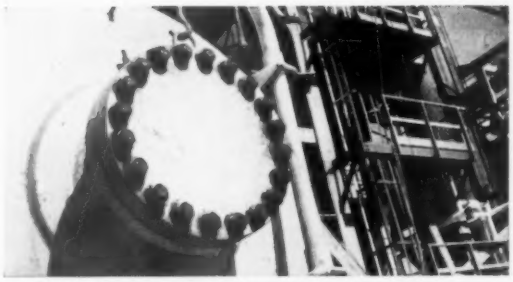

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Du Pont Slices Repair Bills

Its 18-point program cuts maintenance costs, almost doubles labor effectiveness, and boosts process productivity at 79 plants.

How can you beat the rising cost of maintenance? Du Pont is getting almost spectacular savings by an "engineered" assault on repair bills.

Some Du Pont plants are chalking up maintenance savings up to 20% by using better maintenance processes and controls, according to J. C. Jessen, Engineering Service Division, Engineering Department, E. I. du Pont de Nemours & Co., Inc. at the Casper (Wyo.) meeting of the Western Petroleum Refiners' Assn., Sept. 27.

In many Du Pont plants, maintenance labor effectiveness has improved from the 40% to 45% range up to the 70% to 75% range. Some plants have had even better results.

Increased automation and complex continuous processes forced the "new look" at high maintenance costs.

Since 1940, Du Pont's maintenance labor costs have risen 250%, double the rate for all other plant labor, and are now increasing six times as fast as all other payroll costs.

In some continuous chemical and petroleum plants, Jessen points out, the ratio of maintenance to operating employees is 2 to 1, compared to a 1 to 10 ratio in the days of batch-type process plants.

Du Pont meets the challenge of these rising maintenance costs with an 18-point program to reduce "safely" its maintenance labor and materials.

Du Pont has 79 plants in 65 communities in 26 states, and can not set any one standard control system to fit all plants. Instead, says Jessen, 18 flexible "basic tools" for administering maintenance are used:

(1) Proper maintenance organization. Long-range policy making and planning is given to a control group, not a line maintenance group engrossed in daily problems.

(2) Work order system. Work orders are the cornerstone of maintenance control, equipment records, job analysis, work scheduling, and work measurement.

(3) Equipment records. Cards, showing descriptions, equipment and building numbers, applicable drawing numbers, and past repairs are made for each equipment item.

(4) Job planning. Each repair order must be analyzed and planned with the foreman to find what is to be done, and the parts, tools and equipment needed for the job.

(5) Weekly forecasts. Forecasting is basically an agreement between maintenance, operations and maintenance control as to when the work will be done.

About 75% of the work can be forecast with good maintenance controls. Of the forecast work, about 85% can be done during the week planned.

(6) Daily schedules. These show jobs and estimated manhours planned for the next day. Emergency work is listed separately.

Du Pont, says Jessen, has a goal of 4% emergency work limit for a typical well-run plant.

(7) Manpower backlog control. The work backlog is reported monthly. The report is a basis for adjusting the size of the maintenance force.

A crew backlog of three weeks has been successful at most of Du Pont's plants, according to Jessen.

(8) Preventive maintenance program. Such a program, if good, will reduce overtime labor and plant off-stream time.

One Du Pont plant, reports Jessen, has 60% of its maintenance work on a regular preventive schedule.

(9) Budgetary control. About 50% to 60% of budgetary requirements are in the preceding eight points listed above.

(10) Materials control. Without a complete control program to insure availability of materials, maintenance men will cache critical items in remote plant areas.

(11) Plant shutdown plans. Scheduled shutdowns are a must for large-scale, continuous-operation plants where lost production is costly.

(12) Major overhaul procedures. Du Pont believes that there is usually "one best way" to maintain any equipment item. This "best" overhaul way is developed through means of a joint

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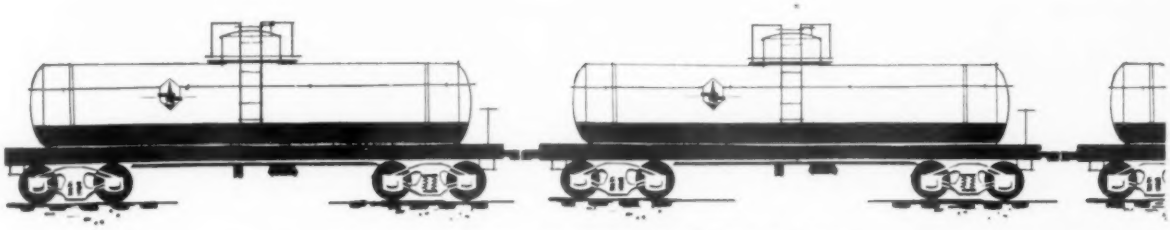

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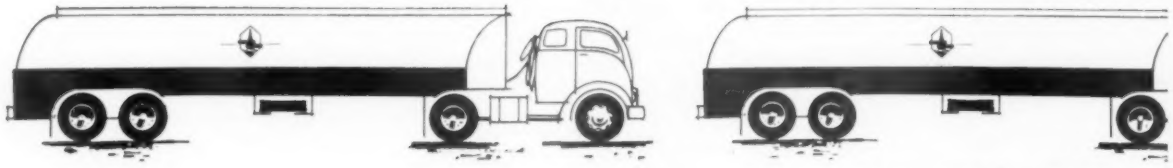

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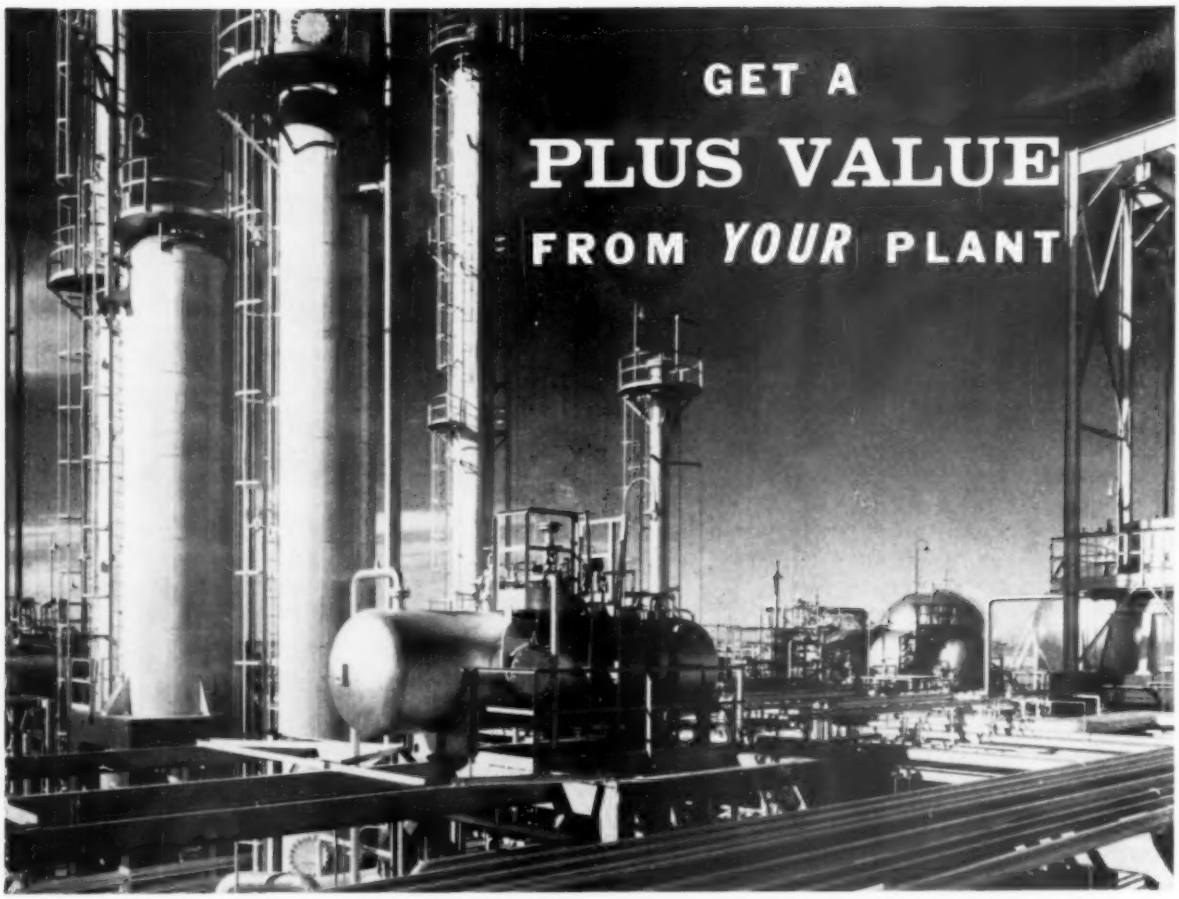

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(15) Equipment improvement. Corrective maintenance and design are long-range plans to simplify maintenance by making parts more accessible, or of a better material, or needing less frequent replacement.

(16) Supervisor training. Maintenance for continuous equipment requires knowledge of process and production equipment, as well as specific "trade" knowledge.

(17) Mechanic training. Du Pont, says Jessen, has found an increase of about 11% in job effectiveness by training mechanics.

(18) Performance and cost analysis. This is a continuing job of self-criticism. Statistical and other study methods are used to find true current conditions and set desired goals.

Britain Eyes Oil-from-Coal

The oil-poor British Isles hope to turn to improved oil-from-coal synthesis to reduce the need for imported oil.

In its annual report, Britain's Fuel Research Board says that the results of research are encouraging.

The report points out that enough coal, now used for fuel and other purposes, may be released by the end of the next decade to spare a portion for making oil.

Promising improvements in the Fischer-Tropsch process for making oil, used by Germany during the war, may make the process economically attractive in the near future.

Improvements have been reported in the manufacture of synthesis gas feed stock—a mixture of carbon dioxide and hydrogen made by passing steam through a heated layer of coal.

A new catalyst system is being used in the actual synthesis step, wherein the synthesis gas is converted into oil-like products. A catalyst suspended in paraffin wax replaces the former iron oxide catalyst suspended in the reactor.

A high yield of gasoline-range products highlights the improved British process.

In experiments at the Greenwich Fuel Research Station, as much as 75% of the initial synthesis gas has been converted into oily products.

In one experiment at Greenwich, at a temperature of 510F and a pressure of 315 psi, 73.4% of the liquid products boiled below 300F.

However, operating and catalyst problems remain to be solved before Britain's improved Fischer-Tropsch process becomes commercial.

The temperature of the reacting synthesis gas must be controlled within narrow limits to control the product formation—a difficult job with a highly exothermic reaction.

The new catalyst-paraffin wax combination raises another problem. Prior art used an iron oxide formed during the rolling of mild steel. This catalyst, however, is unsuitable for use in the liquid paraffin wax suspension.

Catalysts that are suitable and have an activity equal to that of iron oxide from mild steel rolling, have been made by chemical precipitation. However, attempts at large scale production have not been successful so far.

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What's New / IN PROCESSING

The two largest U. S. chemical companies, Union Carbide Co. and E. I. du Pont de Nemours & Co., plan new polyethylene plants.

Union Carbide will build a 72-million-lb.-per-year high-pressure polyethylene plant at Whiting, Ind. Completion is scheduled in the first half of 1958.

Du Pont, second largest polyethylene producer but the largest chemical company, is designing a plant to make linear polyethylene resins at a 600-acre site on the Mississippi River near Laplace, La.

•

Sinclair Oil & Gas Co. will build Gas Products Plant No. 29 in Lea County, N. M., to process gas from the Gladiola and North Gladiola pools of Lea County, and the Bronco pool of Lea County and Yoakum County, Tex.

Initial facilities, to be completed the first quarter of 1958, will desulfurize and dehydrate the gas for return to lease operations.

Gas liquids separation equipment will be completed in the third quarter of 1958. It will produce about 15,600 gal. of propane, 11,600 gal. of butane and 8,800 gal. of natural gasoline per day.

•

Lion Oil Co. Division of Monsanto Chemical Co. plans a hydrodesulfurization unit and 5,000 b/d cat reformer at its El Dorado (Ark.) refinery.

Plans have been submitted to several contractors for bids. Construction will start early next year, with completion in late 1958.

•

Esso Standard Oil Co. has shut down its Baton Rouge (La.) paraffin press operations, in use since 1911.

The old presses were used to extract wax from lube oil stocks. They will be replaced by an expansion of solvent dewaxing facilities.

•

A natural gasoline deisobutanizer is to be built at the El Segundo (Calif.) refinery of Standard Oil Co. of California Western Operations, Inc.

The unit will increase the refinery's isobutane production by about 300 b/d.

Completion is set for December residue gas.

•

The Texas Co. will build a "multi-million-dollar" gasoline unit in the Aneth field of the Four Corners area.

Products from the unit will be natural gasoline, propane, butane, and residue gas.

Other producers, including Gulf, Shell, Humble, Superior, Carter, Pan-American, and Phillips will participate in ownership of the plant.

•

Anderson-Prichard Oil Corp. has finished one of the final steps in its modernization program with the startup of a 5,000 b/d UOP fluid catalytic cracker.

The unit processes atmospheric and vacuum gas oils derived from Oklahoma crude. At design capacity, conversion is 75%, and the coke burning capacity is 7,000 lb. per hour.

•

The first alkylation unit at Socony Mobil Oil Co.'s Buffalo (N. Y.) refinery is scheduled to go on stream this month.

The unit will produce 2,400 b/d of aviation grade alkylate, using sulfuric acid catalyst.

M. W. Kellogg Co. designed and is building the alkylation unit.

•

Gulf Oil Corp. has placed two new 20,000 b/d Gulfiners on stream at its Philadelphia refinery.

Built to "super-refine" home heating oils, these Gulf-designed hydrogenation units are similar to the two year-old Gulfiners in operation at Gulf's Port Arthur (Tex.) Refinery.

•

The second UOP Platformer for McColl Frontenac Oil Co., Ltd., has gone on stream at McColl's Edmonton (Alta.) refinery.

The new 3,300 b/d cat reformer is processing straight-run naphtha from Alberta crude to give a 98-octane (leaded) reformate.

on stream in the United States

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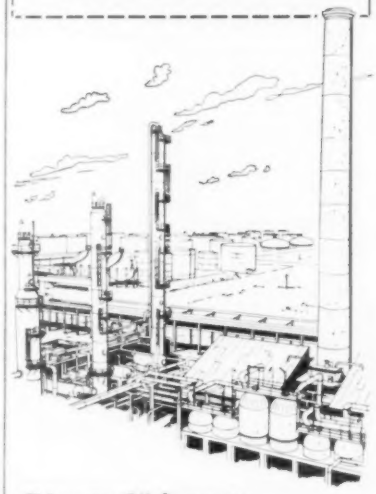

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This is the story of a drilling contractor abroad; more specifically, the story of Loffland Bros. Co. and its growing operations in Latin America.

IN COLOMBIA, Loffland is drilling ahead with this rig near Bucaramanga.

Loffland Bros. Expand in Lati

VENEZUELA—Loffland Bros. Co., Venezuela's—and the world's—largest drilling contractor, now has 29 rigs operating in Latin America. The rigs are concentrated in Venezuela, Colombia, and Costa Rica. The Tulsa firm has had experience in Australia, Cuba, Panama, and Peru as well.

In 1956, Loffland Bros. rigs drilled almost 1.4-million ft. of hole outside the United States. This does not include workover wells or labor contracts.

Most of Loffland's Latin American activity is centered in Venezuela, where it has a full-fledged industrial relations division, purchasing group, truck fleet, and full contact and contract representation.

The company has had rigs in operation in Richmond Exploration Co.'s Boscan field, in western Venezuela, since 1946. That's the year Loffland's first rig arrived in Venezuela. With that rig, Loffland Bros. became the first American drilling company to set up shop in Venezuela as an independent contractor using its own equipment.

Now Loffland operations are spread throughout Venezuela. The company has rigs running on the western side of Lake Maracaibo, near San Jose, as well as in eastern Venezuela. It's central Venezuelan activity, at Roblecito, features trailer-mounted rigs. (The drilling rate there is rapid, and rigs are moved frequently.)

IN EASTERN VENEZUELA, Loffland's Rig #10 is operating near El Tigre.

The company operates two yards to supply its eastern and western Venezuelan operations.

Its western operations are serviced by Loffland's "Kilometer 9 Yard," located about 9 kilometers out from Maracaibo on the Machiquies highway. The yard can outfit a drawworks and the other components of a drilling rig from stock, as well as overhaul and rebuild rigs.

All Loffland rigs in western Venezuela—as well as the central Venezuela headquarters—are tied to the K-9 yard by a radio network.

Eastern Venezuela operations are serviced by a yard at Anaco, where the company has a complete engine overhaul and repair shop.

Loffland Bros. has one of Venezuela's largest trailer camps at Anaco.

The company has also set up two new camps in the eastern lake area, at Las Morachas and San Timoteo, in line with increased activity there.

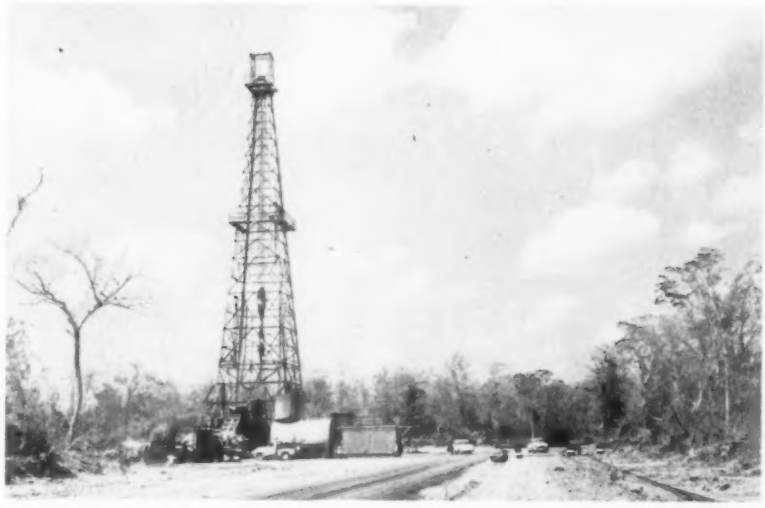
Loffland compares eastern Venezuela drilling conditions to those in Texas: Some formations are penetrated at rates equal to those in the Gulf Coast area of Texas, and others are penetrated at rates similar to those in West Texas. For the most part, however, the formations are neither so dense nor so abrasive as those found in West Texas.

Loffland has five drilling barge tenders in operation on Lake Mara-

W. J. OGDEN, vice-president, is Venezuela general manager.

PAT McCABE is manager of operations.

DONALD MILLER is general superintendent.



IN WESTERN VENEZUELA, Loffland pushes development drilling at Boscan field.

in Latin America

caibo. The tenders, standardized on a design unique to Lake Maracaibo, feature 1,000-hp. slush pumps.

Three of the barge tenders were built by Levingston Shipbuilding, and two by Equitable Shipbuilding.

The first tender went to work in late February on the eastern side of the lake, near San Timoteo, for Mene Grande Oil Co. The others are operating for Venezuelan subsidiaries of Signal Oil Co., Pure Oil Co., Standard Oil Co. (Ohio), Hancock Oil Co., and Superior Oil Co.

To transport crews, Loffland is operating one of the largest crew boat fleets on the lake. These boats, capable of speeds to 30 mph., are among the fastest on the lake, and have been equipped with Cummins Turbodiesel engines.

Loffland's Venezuelan activities are headed by vice-president W. J. Ogden. Assistants to Ogden are: Pat McCabe, manager of operations; Donald Miller, general superintendent; and Bob Cunningham, J. D. Calloway, L. H. Marts, K. A. Holliday, Buryl Morgan, M. W. Watson, Grover Heard, and T. D. Parnell, assistant superintendents. Charles Richardson is the manager of operations in Colombia.

Contract offices are maintained in Caracas, under the direction of Bud Lambert. Company representatives are located in Maracaibo and Anaco, Venezuela; Baranquilla, Colombia; and Puerto Limon, Costa Rica.

IN LAKE MARACAIBO, Loffland operates a crew-boat fleet to service its operations.

IN CENTRAL VENEZUELA, Loffland has set up a new trailer camp at Roblecito.

NEW WILDCAT is spudded offshore in Persian Gulf (left), and Khuraid wildcat tests interior concession area (right) as . . .

Aramco Starts New Offshore Testing

A new offshore structure in the Persian Gulf, southeast of the Safaniya field, is now being tested by Arabian American Oil Co. (PW—Mar.1'57,p34).

Aramco spudded No. 1 Manifa on Sept. 28 at a location 9 mi. from shore. It is some 22 mi. southeast of Aramco's Safaniya field, the first offshore pool in the Persian Gulf.

Object of the No. 1 Manifa is to penetrate and test sands that are productive at Safaniya.

Specifically, it is aimed at testing the potential of the Bahrain sands, but it may be carried deeper into the Zubair.

Both of these have commercial oil accumulations at Safaniya.

The test will be carried to an estimated 7,500 ft. It is being drilled from the Queen Mary drilling barge, used previously at Safaniya. Aramco expects to complete it in ten weeks.

Meanwhile, far inland, Aramco is drilling below 3,956 ft. in the first test on the central interior of its concession area.

The Khurais wildcat was spudded in August in the Dahana sand strip bordering Aramco's preferential-rights area (PW—Aug.30,57,p45). It is about 75 mi. west of the middle of the 152-mi.-long Ghawar Field. It is being drilled with the rig that was used on Aramco's 14,875-ft. Rub al-Khali stratigraphic test.

Object of the wildcat, which is to be completed by early 1958, is to penetrate and test the equivalent of all known oil-bearing formations in eastern Saudi Arabi.

Allen & Co. Confirms Qum Pipeline Deal

Sales of Iran's Qum oil may be made through a newly-formed American firm that may finance construction of a $500-million pipeline to the Mediterranean port of Iskenderun, in Turkey.

This possibility emerged this week following announcement by Iran's Shah that Parliament will shortly be asked to authorize the National Iranian Oil Co. to sign an agreement with the U.S. firm on financing for a big-inch line to Iskenderun.

Under this pact, NIOC would own the pipeline installations in Iran, as well as the oil properties themselves. The new U.S. firm would own the installations in Turkey, it is understood.

Allen & Co., New York investment firm disclosed that it is a major participant in the new company, both directly and indirectly.

The new firm, formed specifically for the purpose of financing construction of the giant line, has no oil company representation, according to Allen & Co.

Besides participating in financing the line, Allen & Co. also would make the arrangements for construction of the line.

But the whole project for a Qum-Iskenderun line is still a very iffy proposition, as both Iran's Shah and Allen & Co. point out.

Oil reserves and feasibility of the proposed pipeline route are the two big questions.

The Shah told the Iranian Senate that construction of the line would be contingent on development of "adequate" reserves that would make the line economically feasible.

So far NIOC, which is the exclusive operator of the Qum area, has only two wells there. One is the spectacular No. 5 Alborz gusher, which blew in wild a year ago. The other is the recent No. 6 Alborz, on which little information has been released (PW—Sep.20'57,p53).

It is understood that the pipeline financing agreement entails a stepped-up development program.

Even if sufficient reserves are developed to warrant construction of the half-billion-dollar pipeline outlet, the proposed route to Turkey presents enormous technical problems, which have not yet been studied.

Iran, however, has already signed a transit agreement with Turkey.

What's New / AROUND THE WORLD

New Unit Opened At Creole Refinery

VENEZUELA—Capacity of Creole Petroleum Corp.'s Amuay refinery has been boosted to 328,000 b/d with completion of a fourth pipe still.

The unit, built by Foster-Wheeler Corp. at a cost of $7.2-million, is a 75,000 b/d single-stage crude distillation unit that can be operated as a crude topping unit at higher capacity. Creole will use it to process 104,000 b/d of Bachaquero heavy crude for production of light naphtha and fuel oil.

Amuay's capacity is now the largest in South America except for the Aruba refinery, which is rated at 440,000 b/d. An agreement between the Venezuelan government and Standard Oil Co. (N. J.)—owner of both Creole and the Aruba refinery—bars further expansion on Aruba, and concentrates future refinery construction on the Venezuelan mainland.

The new distillation unit is part of a $30-million expansion of the Amuay refinery and terminal—where operations were cut back in recent weeks, following an asphalt tank explosion that knocked out the electrical power system.

Foster-Wheeler is also building a 14,500 b/d catalytic hydrofining unit, costing $3-million, to reduce sulfur content of middle distillates; and a 500 b/d lube plant, a phenol extraction unit, a propane dewaxing unit, and blending, canning, and packaging facilities, to cost $8.1-million altogether. The lube plant will produce 25 types of lubricants from Tia Juana medium crude.

The harbor at Amuay was dredged to 41 ft. earlier this year, and a terminal expansion program now under way includes construction of Pier No. 4, as well as 200-ft. additions to three existing piers. When completed, the new installations will permit loading of ten tankers simultaneously.

•

New Syrian Oil Line?

SYRIA—Iraq is categorically opposed to a Turkish outlet for the proposed new Mideast pipeline, Nadim Pachachi, Iraq's Economy Minister, reportedly assured Syria last week.

According to Beirut reports, Dr. Pachachi promised the Syrians he would convince Iraq Petroleum Co. to divert its unused Haifa pipeline system to Syria and Lebanon, if the Syrians in turn would sign treaties guaranteeing the security of existing pipelines through Syria, as well as any built in the future.

The Minister's Damascus visit followed London discussions with IPC on possible new pipeline facilities that would increase Iraq's oil exports (PW—Oct.4'57,p43).

•

New Grant to Pure Oil

PARAGUAY—Pure Oil Co. is expanding its Latin American exploration into Paraguay.

The company confirmed this week that Pure Oil Co. of Paraguay has been granted a 23,400-sq. mi. concession in the Chaco region with a 14-year exploration period, and subsequent 40-year development rights. It is subject to ratification by the Paraguayan congress.

Pure reportedly will pay the government an 11% royalty, plus 30% of profits as income tax.

The first of two tests on the acreage is slated to get under way within eight months.

William Bros. will be associated with Pure in the venture, and additional interests may be assigned to other companies. Pure already holds concession interests in Venezuela, Colombia, Bolivia, and Guatemala.

The Paraguayan concession is the third granted in the Chaco region by the government. Holders of the first two—International Products Corp. and Carlos Casado, Ltda. (PW—Aug.9'57,p46)—are negotiating with U.S. companies to develop their acreage.

•

Iran–Italy Deal Clarified

IRAN—The Official Gazette has now published clarification of several ambiguous points in the controversial Iranian-Italian oil pact (PW—Sep. 20'57,p48).

National Iranian Oil Co. and AGIP Mineraria, the partners in SIRIP, agree that:

- The Italian managing director of SIRIP is authorized to grant a 5% discount off posted prices in sales of crude without the consent of other directors. For greater discounts, he must have the approval of the other five board members.
- Within the next four years, PAGIP must start drilling at least one well in each of the three areas granted to SIRIP.
- In order to provide AGIP with the Iranian currency needed to cover its exploration costs in Iran, NIOC binds itself to buy the needed equipment from Italy, insofar as possible.
- The Iranian government will have final approval on any transfer of SIRIP shares outside of the NIOC or AGIP groups. (Transfers within the two groups may be made without such approval.)

None of these points appear in the contract itself, or in the articles of association implementing it. The latter, which has 42 articles, has now been made public, along with detailed maps of the three areas.

Appointed to the six-man SIRIP board are three Iranians: Emir Gholi Azeri, chairman; Hushang Farkhan; and Jaafar Kamali. The Italians are: Signor Sarti, managing director, who will also be director general; Signor Sette; and Signor Yakobom.

•

GERMANY—American Independent Oil Co. has signed a 15-year agreement to supply Persian Gulf crude for a projected 30,000 b/d refinery at Emden.

Ralph M. Parsons Co., of Los Angeles, has been awarded the contract to build the $15-million plant for Erdoelwerke Frisia A. G. The latter was formed earlier this year by Swiss marketer Gottlieb Duttweiler. According to earlier announcements in Germany, Aminoil is also investing in the plant (PW—Jul.26'57,p51).

•

VENEZUELA—Atlantic Refining's third try on a Pedernales area farmout has resulted in completion of a 300 b/d producer.

The company drilled the wildcat, No. 2-A Capure, on a 36,500-acre tract in eastern Venezuela, in which it holds an equal interest with Seaboard Oil.

The well was drilled to total depth of 5,364 ft., where formation difficulties prevented further drilling. After testing upper horizons, the company completed the well at 1,848-60 ft., where it flowed the 300 b/d of 22-gravity oil.

Earlier, Atlantic abandoned No. 1 Capure as a dry hole at 10,003 ft., and No. 2 Capure at 3,152 ft., due to mechanical difficulties.

Despite low rates . . .

More Big Tankers Coming

The current slump in tanker rates notwithstanding, tanker operators last week showed new long-range confidence that things will get better.

Two companies, National Bulk Carriers, Inc., and Barber Oil Co., have just taken steps that will add substantially to world tanker fleet tonnage—despite the fact that some economists foresee a heavy surplus in tankers by 1961 (PW—Mar.15'57, p61).

D. K. Ludwig's National Bulk Carriers, Inc., made the more sensational news. The company has placed an order for five 104,500-ton tankers—probably the largest private shipbuilding ever ordered (PW—Oct.4 '57,p6).

Ludwig, the "mystery man of U.S. shipping" (PW—Mar.15'57,p11), will have the five tankers built at the Kure (Japan) shipyard, which he has leased since 1951. The lease runs through 1961, and Ludwig has an option to extend it through 1971.

Ludwig is probably the only major shipowner who works on an "integrated basis." He builds ships, operates them, and will soon have a huge new yard for repairing them.

The newly-ordered tankers will be powered by 27,000-hp. steam turbines for "relatively low speeds" (less than 16 knots). The giant new tankers will be far too wide for the Panama Canal and too deep for the current Suez Canal depth. They will be about 900-ft. long, with 135-ft. beam. The only merchant ships now in operation larger than Ludwig's forthcoming 104,500-tonners are the Queen Mary, the Queen Elizabeth, and the United States.

Construction on the first of the 104,500-tonners is expected to begin in June. When the vessel is completed, it will replace Ludwig's 85,000-ton tankers as the largest in the world. But even bigger ships will snare the heavyweight title soon after.

Although long a pace-setter in the size of individual tankers, Ludwig will lose this lead shortly after the first 104,000-tonner is put into service. Aristotle Onassis has two 106,000-tonners being built at Bethlehem Steel Corp.'s Quincy (Mass.) shipyard, and Stavros Niarchos has another of the same size on the way. And Onassis may not be done ordering yet. He's given strong indication that a still larger heavy-weight champ—a 135,000-tonner—is a definite possibility.

Such supertankers lend new weight to the growing shipping faction that reasons this way: Oil can be carried more cheaply in a huge ship that must sail a long distance than it can in a small one that can cut off miles by use of the canals.

The newly ordered Ludwig ships will swell National Bulk Carriers' fleet to over 2.5-million deadweight tons. This would appear to give Ludwig—temporarily at least—the lead in the race for the world's greatest private fleet.

Ludwig is racing, of course, Niarchos and Onassis. It is difficult to pin down with certainty total tonnage for any of the contestants, but Ludwig's estimated 2.5-million tons appears to give him the lead over both Greek shipping magnates.

Second long-range confidence item: Barber Oil Co. is forming a subsidiary, Hercules Liberia Corp., to take care of its forthcoming tanker interests. Legal details have not yet been cleared up for formation of the subsidiary, but they will be soon.

Hercules-Liberia will have six new 46,000-ton tankers—just ordered—working for it by mid-1960.

Bethlehem Steel will build the tankers for Hercules Liberia either at Quincy or at Sparrow's Point, Md.

The first of the ships is scheduled for delivery in February, 1959. Others will come into service August and November, 1959, and in February, June, and July, 1960.

All will be operated under the Liberian flag.

Neither Ludwig nor Barber Oil will say specifically what is the basis for such optimism. However, a belief that demand forecasts for areas served by tankers have been too conservative has more than likely played an important part in their decisions.

Most oil companies have been working on the cautious assumption that oil demand will rise only 4% annually in the U.S. and 8% in Europe. But some independent tanker owners—Ludwig and now Barber Oil, apparently, included—are counting on a steady demand rise at a much higher rate. Some go as high as 12% in their estimates for Europe and are equally optimistic about U.S. demand.

The economics of large-size tanker operation make logical a trend toward gradual replacement of T-2 sixe tankers (about 16,600 tons) by supertankers. But the current rush to build supertankers (a recent estimate: 9.2-million tons of "big tankers"—over 40,000 tons—are being built or are on order), and the resulting significant increase in total tanker tonnage can only be justified by heavy demand increases.

Nevertheless, many tanker experts say that the current tanker surplus, which is causing depressed rates and, consequently, a rising lay-up fleet, will continue and probably grow worse.

Tanker rates reported last week weren't anything for tanker operators to write home about: Quotations out of the Gulf Coast were USMC—35%; out of the Caribbean, USMC—55%; and from the Persian Gulf, USMC—60%. Although rates are expected to rise in a few weeks because of increasing movement of "winter products," they're not expected to climb above the range of USMC—20% to USMC flat.

And the annual cycle is expected to bring rates down again in the spring, with little or no over-all gain.

On Ludwig, one source told PETROLEUM WEEK: "He's probably all right. After all, he has his own yard, and he's probably got contracts for the new tonnage all sewn up.

"But over-all, the tanker market doesn't show any real promise of snapping out of the doldrums even on a long-term basis. Those estimates six months ago about surplus tonnage are looking pretty smart these days."

Barring another Suez-type crisis, the source says, there just won't be enough oil-hauling business in future years to support both new tankers and the older ones.

The increased cost of lay-ups has proved a deterent to a sharp rise in tankers being put "on the shelf."

Ship owners found in 1954—when about 300 tankers were laid up—that idle time was more expensive than they had estimated. So they're keeping tankers in service wherever possible.

British Petroleum Co., for instance, has found a "saving" by routing 20 of its large tankers around the Cape of Good Hope rather than through the Suez Canal. Although the longer voyage adds "considerably" to operating costs, it does avoid an early withdrawal of the ships from active service—an even more expensive proposition according to BP's figuring.

What's New / IN TRANSPORTATION

New Texas Eastern Expansion Approved

A Federal Power Commission examiner has authorized a $29-million expansion in Texas Eastern Transmission Co.'s gas system, which would bring the system's estimated sales capacity to 1.9-billion cu. ft. of gas daily.

FPC examiner E. J. Woodall last week gave Texas Eastern the go-ahead on its proposed 96.5-mi. of 30-in. loop line between Kosciusko, Miss., and Uniontown, Pa.; a new 10,250-hp. compressor station and addition of 33,360 hp. to existing compressor stations on the Kosciusko line; and about 9.4-mi. of lateral supply lines.

The FPC examiner also approved an addition on the line of Texas Eastern's subsidiary, Texas Eastern Penn-Jersey Transmission Corp. Penn-Jersey was authorized to build a 24,000-hp compressor station on its system from Westmoreland County, Pa., to Texas Eastern's compressor station No. 26, near Lambertville, N.J. The station will be leased and operated by Texas Eastern.

Texas Eastern will be able to sell for resale an additional 128,217 cu. ft. of gas a day as a result of the additions.

The current looping program on the Kosciusko Line (PW—Aug.16'57, p56) will make it Texas Eastern's largest natural gas trunk.

•

Nato Line Extended

A new extension of the NATO gasoline pipeline under the lower Rhine River was completed recently.

The 1,500-ft. line will connect the NATO airbase at Weeze-Laarbruch, near Xanten, West Germany, to a planned tank farm in Bruenen (east of the town of Wesel).

The NATO gasoline line now stretches from the Atlantic Coast of France across northern France, Belgium, and Holland, and now across the Rhine. It will be further extended shortly to Muenster and to the northern Ruhr.

•

Williams Bros. Co. is in the market for additional working capital.

The company, engaged in world-wide engineering and construction of pipelines and related facilities, has sought registration of 400,000 shares of its common stock with the Securities & Exchange Commission. The price of the stock offering will be announced later.

•

Continental Oil Co. has bought into Butte Pipe Line Co., which operates the 510-mi. crude line from northeastern Montana down to southeastern Wyoming.

Continental last week purchased a 12.5% interest in the line from Placid Oil Co., Shreveport. The Butte line runs from Montana's East Poplar field down to Fort Laramie and Guernsey, Wyo., where it connects with the Continental Pipe Line Co., Platte Pipe Line Co., and Service Pipe Line Co. lines to Rocky Mountain and Midwest refineries.

•

Shell Pipe Line Co. will build a common carrier crude line from an offshore Louisiana producing area to its Norco refinery.

The proposed line will pick up crude at Shell's Southwest Pass terminal (about 100 mi. southeast of New Orleans) in the Mississippi delta. A Shell spokesman told PETROLEUM WEEK this week that it is still too early for any other details on the line.

•

Britain will beat Japan to the first movement of natural gas by tanker. It now appears that the British shipment will be made in about 18 months.

A Japanese firm recently announced that it would make tanker shipments of liquefied natural gas in a few years (PW—Sep.27'57,p51).

Success of either the British or Japanese plans would mean that areas with large natural gas demand, inaccessible by pipeline, could be served economically.

The first transoceanic shipment of liquefied-transported gas will move from Venezuelan fields to Britain in a special, 5,500-ton tanker. The tanker will have special refrigeration facilities to keep methane at —250F, the temperature necessary to keep the gas liquid.

You'll roll no snake eyes when dealing with Tex-Tube. You'll find instead a complete inventory of industrial pipe and tubing. And delivery is swift, sure, from Tex-Tube's own fleet of trucks.

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Q. Is this a laboratory or a station?
Magnolia Sales Development Center
CABELL'S
A. Both. It's Magnolia Petroleum's new center for testing tomorrow's sales techniques.

"PRIVATE OFFICE" for dealer in corner of main display room in station is one of Magnolia's test innovations.

FILE RACK that conserves valuable space is typical of the new equipment being tried out at the new center.

Research Hits the Driveway

To the Dallas motorist, the new service station in the pictures on this page is merely another modern outlet. To Magnolia Petroleum Co., it's a high-priority research center. Reason: It tests new equipment, new station designs, and new selling techniques—all as essential to future success in marketing as the advances being made in the technical laboratories are to success in production and refining.

Magnolia (Socony Mobil's Southwest affiliate) isn't the only company with a continuing program for modernizing its sales efforts. But the new Dallas station, plus an expanded training program to pass along new ideas to dealers, move Magnolia a jump ahead of many of its competitors.

Called the Sales Development Center, the station has a building twice the normal size. The rear half has office and classroom space (where a three-man staff supervises both research and training activity). The front half is a normal station building, set on a wide driveway with two pump islands. It is here that the actual testing takes place.

CLASSROOM in the Dallas "lab" is one of three used for instruction of dealers.

Magnolia's research goals: (1) improving the "showcase look" of stations; and (2) giving still better service faster. Thinking behind the program is outlined by the company's manager of sales, Ed Williams, this way: "We're building on the fundamentals of good merchandising. We're convinced the station must have all its services and products on display for the public. But we know it must also provide quick, efficient service with a minimum of effort on the part of the customer in getting in and out of the station.

"The main duty of a service station is to help make the customer's driving as safe and pleasant as possible. To do this, the station must sell a complete line of inspections, to catch such things as bad windshield wipers, nails in tires, or batteries that are starting to go dead."

On the driveway, experimentation with lighting is one of the projects under way. At present, the pump island nearer the road is being lighted by tall floodlights—while the island closer to the station is getting brighter, concentrated light from fixtures over the pumps. Other tests arrangements:

- The soft-drink dispenser is inside the lube bay—where it can be seen easily through a glass door but does not compete with product displays in front of the station.
- There is a larger-than-usual parking area for cars requiring service. This is because the industry trend toward more service work at stations is creating crowded conditions at stations built as recently as a year ago without expanded parking space.
- One pump island has an upright stand for dispensing air and water. The other island has a well for this.
- Each island has only two pumps, although each is long enough to take four pumps. The extra space is used for air and water dispensers, and for display of motor oil and tires.

Inside the station building, Magnolia is trying out such modifications as a "private office." The dealer's desk is on a raised platform in a corner of the display room, "curtained" from the rest of the room by shelves of products (picture). A window gives the dealer a view of the lube bays.

The ladies room in the station has a full-length mirror. And there's extra space for children, with the heater up on the wall, out of reach.

In the lube bays, Magnolia is experimenting with different kinds of lifts, and adapters for them.

The new sales development center is the hub of an intensified training

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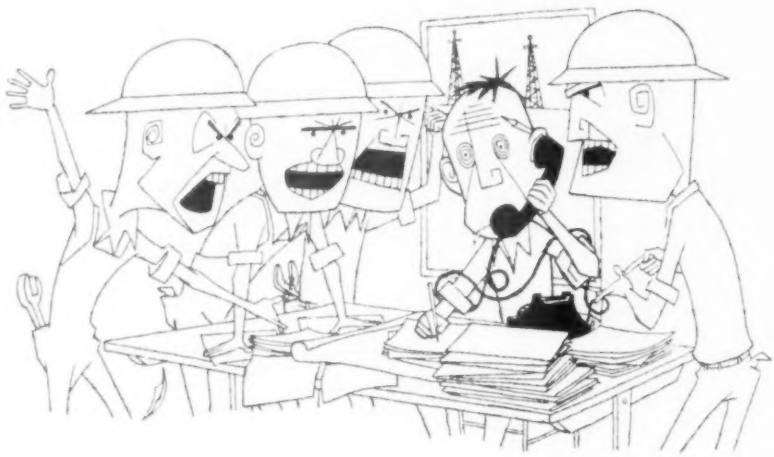

All day long, it's

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program, which will include construction of eight district training stations. Scattered strategically through Magnolia's five-state marketing territory, these district centers will be on a smaller scale than the one in Dallas. They will, for example, have only one classroom instead of the three at Dallas. The first is now being built in San Antonio.

All nine of the training points will pass along to station operators the sales techniques and equipment recommendations developed by the main "lab."

Observes Magnolia's Williams, "The only way we can meet the motorist's demands for more and more service is to produce better-trained manpower. We are trying to upgrade the job of servicing cars. For instance, we now call station help driveway 'salesmen,' instead of 'attendants.'

"We are giving the men intensive training in retail selling, product knowledge, and service work."

To evaluate its program, Magnolia will poll motorists. "We are getting some voluntary comment," concludes Williams, "and customer reaction to our innovations is encouraging. But we'll take scientific samplings to make sure we're on the right track."

What's New / IN MARKETING

Trading stamps such as those offered at service stations were ruled legal by the Federal Trade Commission last week. After a year's study, FTC found that stamp plans in themselves do not break any laws against lotteries, exclusive dealing, price discrimination, deception, or conspiracy to restrain trade.

This means that FTC will not place any general ban on stamps. But if the commission thinks individual companies are guilty of specific illegal practices in stamp use, it may issue complaints.

•

The "small car" became a larger factor in service station marketers' thinking last week when American Motors announced that it will concentrate on smaller models.

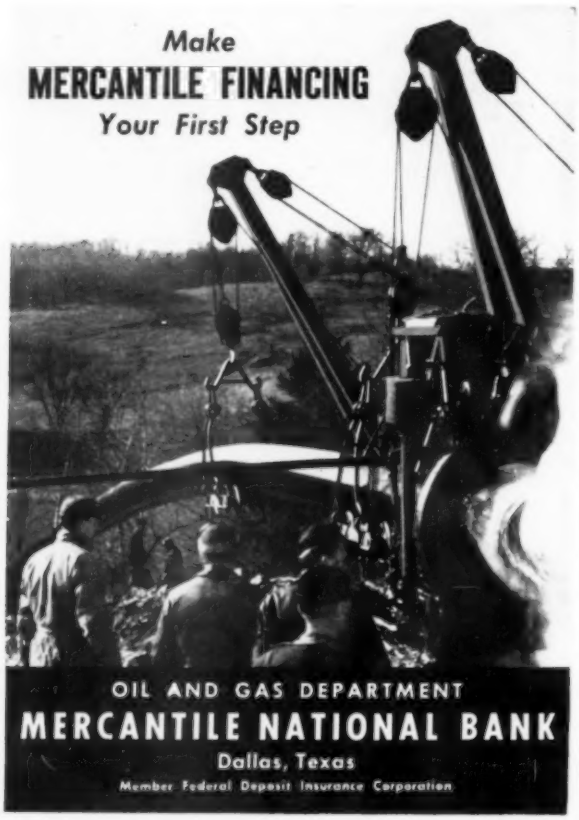
Economy and compactness will be stressed in the company's three lines of cars. All will be called the Rambler, with the dropping of the Nash and Hudson names. Heading the list will be a revival of the 100-in. wheelbase Rambler (nearest thing to a U.S. small car), to compete with Volkswagen, Anglia, and other foreign makes.

Growth of the small-car market will require shifts in service station inventories of tires, batteries, and accessories, as well as new service-work requirements. Also, small cars tend to retard premium gasoline sales.

How heavy will the impact be? George Romney, president of American Motors, predicts that small cars will account for 7% to 8% of total U.S. sales next year. He thinks this will climb to 50% in the 1960s.

•

Shell and Ohio Oil last week drew a sharper bead on sales in markets near Chicago. Shell opened a new regional office in Chicago, enlarging the territory formerly handled out of the St. Louis office. Ohio Oil created a Chicago marketing district, with headquarters at Des Plaines, Ill.



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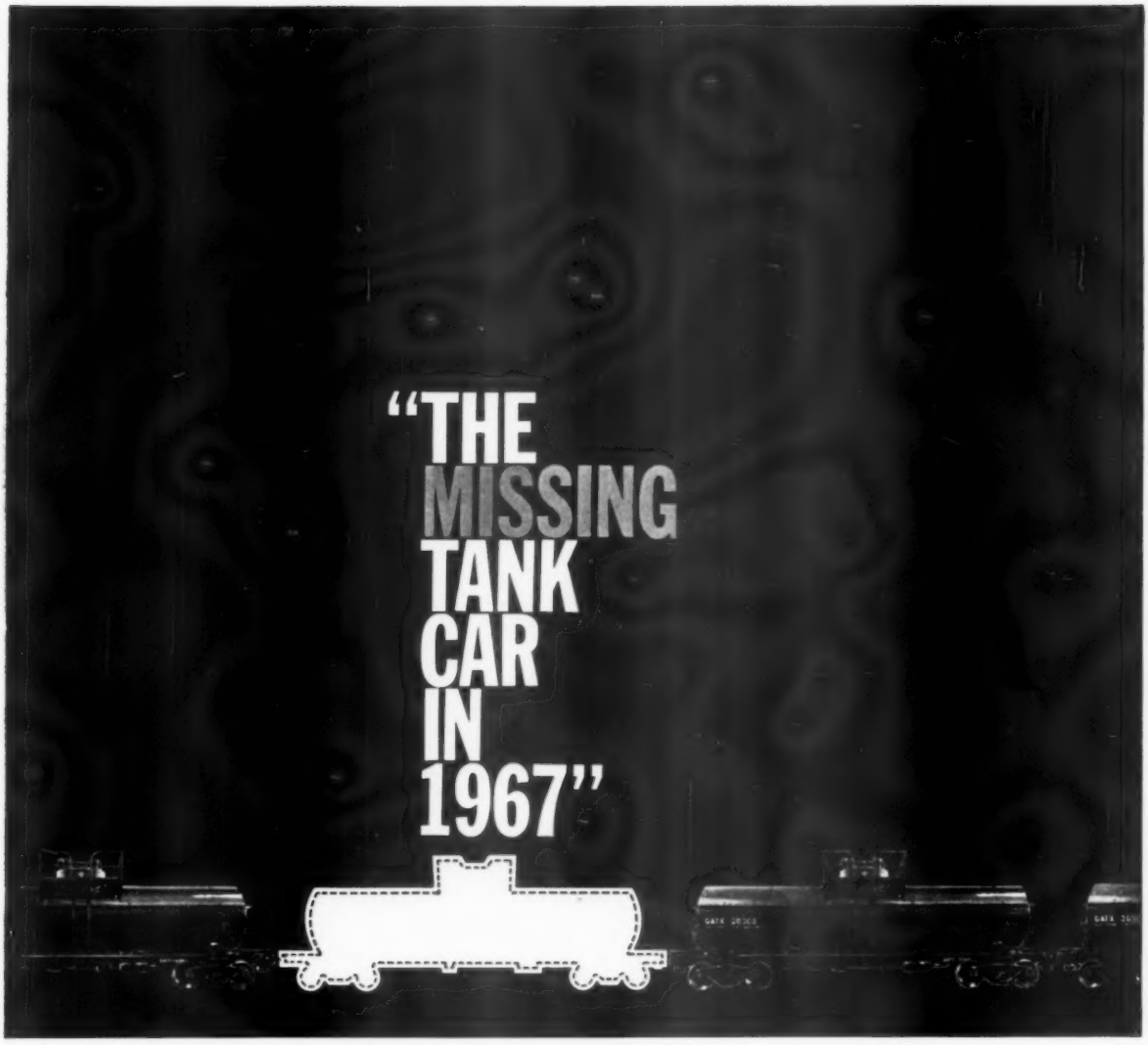

"Somebody was guilty. Here we are—production coming out of our ears—sales opportunities popping in every direction—new profits practically under our noses—and somebody had failed to order enough general-purpose tank cars to make deliveries.

We should have seen it ten years ago. Way back in 1957, almost every economist kept telling us business would expand more than 50% in the next decade—steel was going to be tough to get—normal obsolescence would subtract even more cars and new tank cars couldn't be built overnight. But—we put off doing anything about it. Then it was too late. Maybe your company can benefit from our experience."

P. S. Plan now to discuss your long range needs with our GATX District Man. You'll find . . . it pays to plan with General American.

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Who Is He?

Dear Sir:

I would like to inquire as to the subject and source of the picture illustrating the "On Land" exploration section of the article entitled "Needed: More Geological Research" [PW—Sep.6'57,p19].

I have reason to believe that the bald-headed gentleman bending over the plane table is me, when I worked an area near Vernal, Utah, in late summer of 1954. I recall several pictures were taken by local papers and sightseers, and wondered how one of them might have ended up on the pages of your magazine.

Incidentally, I am an enthusiastic reader and subscriber to your magazine and believe that it fulfills a need in the industry which has long been neglected.

CLAUDE M. BURNETT
GEOLOGIST
DALLAS, TEX.

We're sorry that we cannot identify the man in the photograph (above). Can any of our readers help Mr. Burnett?

Summer Refinery Runs

Dear Sir:

Your recent editorial [PW—Jul.26 '57,p62] suggests that announcements of reductions in refinery runs, in a number of cases, were merely cutbacks from schedules that had been planned for the summer months, rather than actual reductions in operating levels.

We can speak only for ourselves, but this is certainly not the case for Esso Standard Oil Co. We made two cutbacks. The first, for the month of June, reduced our average daily crude runs 10,500 bbl. below actual runs in May. Our runs for July were again reduced, and were another 20,000 bbl. below the actual daily figures for June.

In these two months, the volume of oil processed by Esso Standard refineries was nearly 10% less than in the same months of last year.

WILLIAM NADEN
EXECUTIVE VICE-PRESIDENT
ESSO STANDARD OIL CO.
NEW YORK, N. Y.

Petroleum Week's comments were based on the industry's performance. The decline in refinery runs in June was less than half of the announced cutbacks plus the volume closed down by strikes. Such a performance appears to be a historical trend with the oil industry.

Lower Prices, Taxes?

Dear Sir:

I have just read some of the articles in your Sept. 20 issue, in which the lack of demand for gasoline is the featured article.

I am just wondering if the oil companies, with all their savings in transportation, new techniques, and such, have not thought of pricing their product to encourage demand. With all the demands for their products showing a smaller increase than forecast, it is thought that they could pass some of the touted savings on to their consumers by price reductions.

Then again, it might be well for the industry to take a good look at the tax structure. The automobile has for years been a willing but overburdened workhorse of our economy. The American people grumble, but pay those taxes. I think the oil industry should unite for a more equal tax distribution.

A survey of the parking lots of American industry will show many station wagons parked, where just a year ago there were two cars parked for each station wagon. They are pooling the ride to save paying for that high-priced gasoline. I am sure that a study will show that they have nearly priced themselves out of a market.

M. L. BERGMAN
MONROE REALTY CO.
MONROEVILLE, ALA.

Orchids

Dear Sir:

In behalf of the Colorado Oil & Gas Conservation Commission, let me express our appreciation and thanks for your article, "New Era Opens for Unitized Rangely" [PW—Aug.30'57,p19]. I think your article is the best we have seen.

Our commission is, of course, anxious that this unit agreement have adequate publicity, principally because it will encourage the formation of other units. If I had known what I have learned since Aug. 21, I think we would have estimated that unitization will mean 600- or 700-million additional bbl. of recoverable oil.

WARWICK M. DOWNING
CHAIRMAN
OIL & GAS CONSERVATION COMMISSION
STATE OF COLORADO
DENVER, COLO.

Dear Sir:

Your article on "Tooling up Overseas" [PW—Aug.23'57,p39] is an outstanding piece of work. Information such as this will no doubt make it much easier for those entering the foreign petroleum industry to plan their operations and avoid some of the pitfalls that have been the undoing of some of their predecessors.

DONALD W. McGEE
ASSISTANT TO THE GENERAL MANAGER
SAHARA PETROLEUM CO.
NEW YORK, N. Y.

Dear Sir:

We are active in various parts of the world and are continuously amazed at the alertness and accuracy of your publication. Keep up this kind of reporting, and the industry will continue to benefit by your rapid dispersal of the important news events.

C. W. ALLEN
WM. ROSS CABEEN & ASSOCIATES
DALLAS, TEX.

Dear Sir:

All of us at The Western Co. were extremely pleased and proud of the presentation in PETROLEUM WEEK concerning our "FI" [fracture initiation] process [PW—Aug.2'57,p21]. Even though we feel that it is a major contribution to the industry, we are flattered that your publication felt it warranted such extensive coverage.

JOHN P. MANSFIELD
THE WESTERN CO.
MIDLAND, TEX.

PETROLEUM WEEK will publish from time to time comments from readers on timely, pertinent subjects. Expressions of opinion are welcomed; they should be kept as brief as possible.

Address all such correspondence to LeRoy Menzing, Editor, PETROLEUM WEEK, 330 W. 42nd St., New York 36, N. Y.

TAKE A TIP FROM

ON HANDLING TOUGH CORROSIVES!

USE CHIKSAN LOADING ARMS

To maintain smooth production schedules, Eastman Kodak brings corrosive solvents and acids to its Rochester plant via truck from nearby tank farm storage. Corrosive action, however, was destroying loading hoses after comparatively short periods of use. To overcome this costly problem. Kodak replaced its hoses with Chiksan Loading Arms. That was 10 years ago. Today, there are over 40 Chiksan Loading Arms in service at Kodak Park and not one record of product fatigue to date.

Whatever your fluid handling requirements, be it corrosive or other, insist on Chiksan Loading Arms—the time proven answer where the accent is on service, safety and speed.

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FOR CATALOG, WRITE DEPARTMENT 1310

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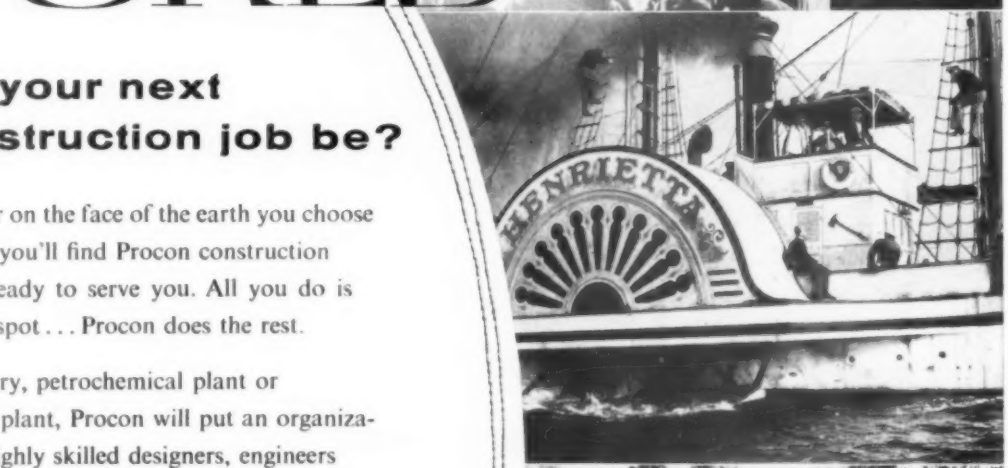

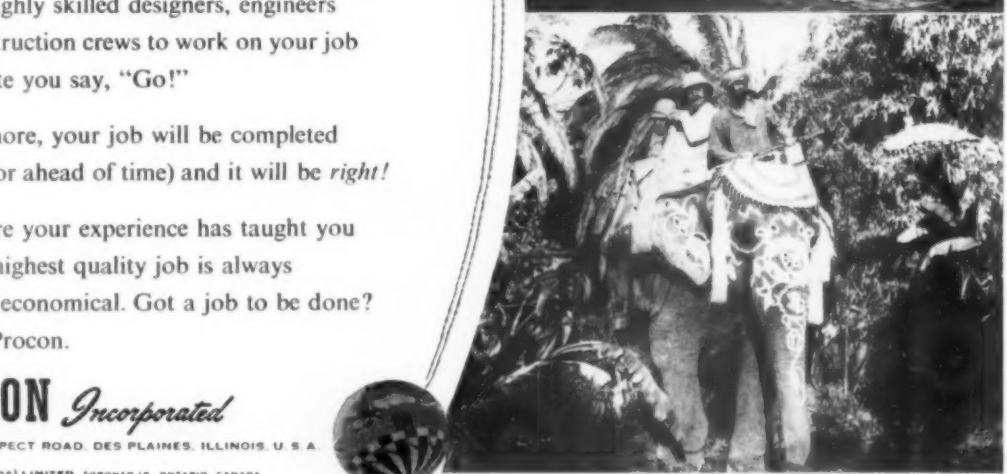

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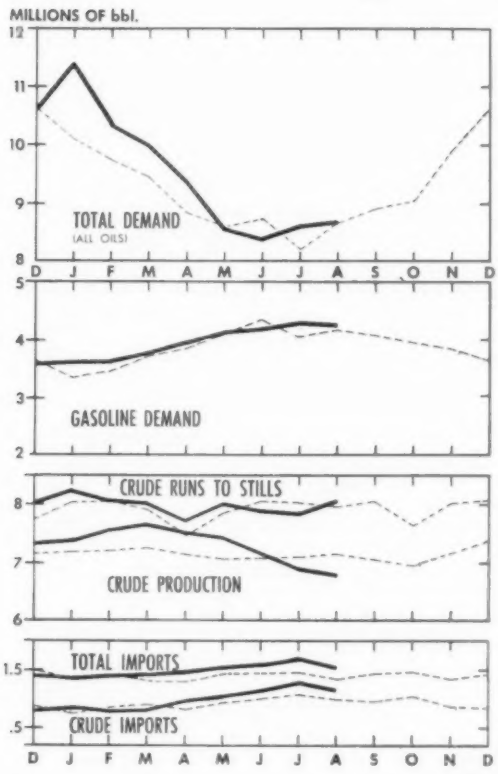
WORLD-WIDE CONSTRUCTION FOR THE PETROLEUM, PETROCHEMICAL, AND CHEMICAL INDUSTRIES

Photos courtesy of Michael Todd's Academy Award winning production, "Around the World in 80 Days"

PETROLEUM WEEK'S

Fingertip Figures



Supply-Demand Figures for September

(millions of b/d)

	September 1957	% Change from year ago	9 Months 1957	% Change from year ago
Total Demand (Inc. Exports)	8.636	0.0	9.352	+3.9
Gasoline	3.986	+3.3	3.972	+2.6
Distillates (Inc. Kerosine)	1.521	—11.2	2.018	+1.5
Residual	1.454	+5.0	1.607	+2.1
Total Supply	9.171	—1.3	9.621	+2.9
Domestic Crude	6.822	—3.3	7.270	+1.7
Nat. Gas Liquids	.800	+1.0	.807	+3.3
Total Domestic	7.622	—2.8	8.077	+1.8
Crude Imports	1.107	+6.2	1.012	+7.6
Total Imports	1.549	+7.0	1.544	+9.1

RUNS TO STILLS

Latest week	7.779
Previous week	7.918
Year ago	7.697

CRUDE PRODUCTION

Latest week	6.812
Previous week	6.821
Year ago	7.022

TOTAL IMPORTS

Latest week	1.656
Previous week	1.360
Year ago	1.489

CRUDE IMPORTS

Latest week	1.199
Previous week	.964
Year ago	1.008

The percentage gain in 1957 demand over last year continues to decrease with each succeeding month. Demand in the first nine months ran only 3.9% over 1956.

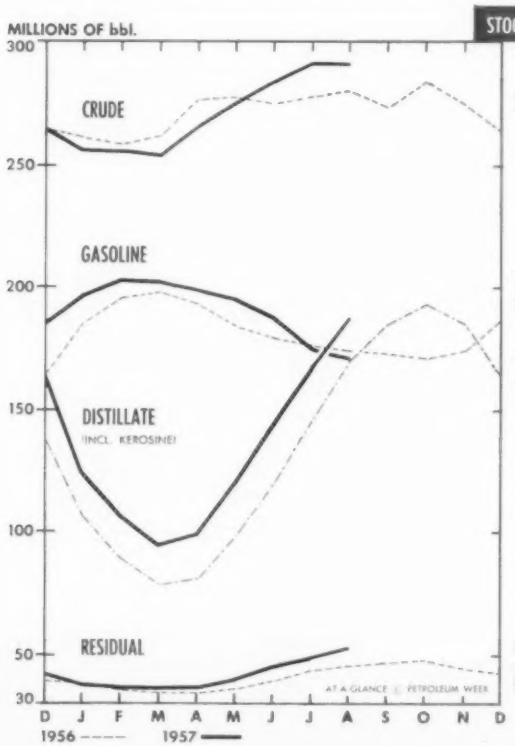
In the first quarter of the year, total demand ran 8.7% over 1956, and for the first two quarters of the year, demand topped 1956 by 5.4%.

Demand in July was up 5.1% over 1956, but August recorded a gain of only 1% and September's total demand averaged 4,000 b/d below last September.

The rate of new supply, though, is not declining in line with the rate of consumption, even though there was some relative improvement in the past month.

Total supply in the first nine months exceeded demand by an average of 269,000 b/d. Last year, supply was 344,000 b/d higher than demand in the first nine months.

September's new supply ran 1.3% under a year ago. All of the decline was due to a cutback in domestic production.



CRUDE STOCKS

Week-ended 9-28	282.4
Previous week	283.2
Year ago	278.7

DISTILLATES

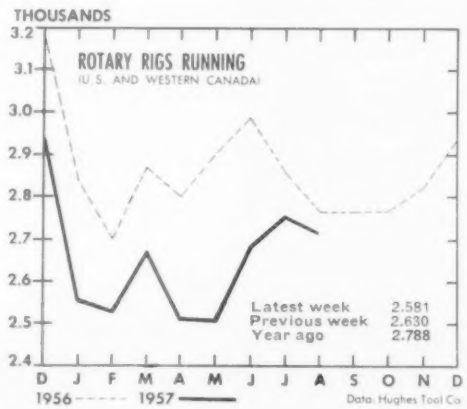
Latest week	207.0
Previous week	205.6
Year ago	185.0

GASOLINE

Latest week	177.4
Previous week	177.4
Year ago	176.0

RESIDUAL

Latest week	58.1
Previous week	57.7
Year ago	47.3


THOUSANDS
ROTARY RIGS RUNNING
(U. S. AND WESTERN CANADA)
Latest week 2.581
Previous week 2.630
Year ago 2.788
D J F M A M J J A S O N D
1956 ----- 1957 ——
Data: Hughes Tool Co.

The Market Trend

For Refiners: Sympathy Cards in October

The word of the week with refiners: Luck. "Just hope we can luck through October," they're saying, "and then let the Weather Man write the ticket from there on out." Anxiously watched are the steadily mounting stocks of fuel oils. From a price standpoint, the East Coast and Gulf Coast are queasy on No. 2 fuel. The Mid-Continent and Upper Midwest are weak on residual.

October almost always is a gloomy month for refiners. The news is seldom good. The month is a fretful waiting session until fuel oil demand starts to pull down inventories. Then, too, the gasoline "season"—if it warranted the name—is waning. As one major puts it, the increase in gasoline stocks at New York and Philadelphia refineries is "alarming."

Heavy fuel could use some cold weather very soon. Oklahoma No. 6 prices slipped 10¢ last week, to $1.75, and buyers thought they could do 40¢ better if they tried. There was distress residual, also, in the Rocky Mountains.

In the Upper Midwest, natural gas cut-offs were eagerly awaited by sellers of industrial fuel. In Chicago this week, refiners were quoting 8.1¢ a gal. for No. 6, but weren't sending buyers away empty-handed if they had ideas 0.75¢ lower.

Most of the light fuel oil reports had—for refiners—a distressing similarity: free supply, creeping discounts, gimmicks on billing. A New England supplier deferred his already-deferred summer No. 2 billings from Oct. 1 to Nov. 1. A Boston supplier shook up the Back Bay with 0.25¢ discounts. In Toledo, there were vague reports of fresh allowances to railroad diesel buyers.

Probably the most encouraging development was Atlantic Refining's withdrawal of its 0.25¢ distillate discounts in Philadelphia and Trenton, N. J. (PW—Sep.27'57,p64). This move may turn out to be an extremely important hurdle. For many traders fear that the East Coast is so shot with discounts that the huge New York harbor market won't be able to stand the pressure.

If Philadelphia prices were to pull down New York—refiners' margins being what they are—then it might be time to look for something lower in the way of prices for crude.

U.S. Oil vs. Foreign:

Dyed-in-the-wool traders see more squabbles to come over U.S. vs. foreign crude prices. The hush-hush whisper this week is that one prospective North American refiner will get his plant built virtually for free—as an incentive to run foreign crude.

Note also that many of the most modern service stations—the ones costing from $80,000 to $150,000—are often being built by companies operating on foreign crude. The comment of one large operator: Refiners working solely on domestic crude, and at U.S. refinery margins, can't hold the pace.

BP Reroutes 20 Tankers:

British Petroleum is rerouting 20 of its large tankers around the Cape of Good Hope to beat the surplus tonnage problem. The longer voyages to the United Kingdom are more expensive than Suez transits. But, BP says, they're cheaper than laying up tonnage.

The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All prices as of October 7

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U.S. Gulf Coast, cargoes
- **Gasoline, 98 oct prem** ... **13.25-14↓**
- **Gasoline, 92 oct reg** ... **11.5-12.375↓**
- **Kerosine** ... **9-10.5↓**
- **Heating oil, No. 2** ... **9-10.25↓**
- **Gas oil, 48-52 d.i.** ... **9.25-10.5↓**
- Fuel oil, bunker "C" ... $2.55-3.15

Caribbean, cargoes
- Avgas, Grade 100/130 ... 17.5
- Gasoline, 93 oct research prem ... 11.75
- Gasoline, 87 oct research reg ... 10.875
- Gasoline, 79 oct research ... 10.125
- Gasoline, 70-72 oct motor method ... 9.75
- Kerosine ... 9.25
- Heating oil, No. 2 ... 9
- Gas oil, 48-52 d.i. ... 9.25
- Fuel oil, bunker "C" ... $2.55

New York Harbor, barges
- Kerosine ... 10.75-11.25
- Heating oil, No. 2 ... 10.25-10.75
- Fuel oil, No. 6 ... $2.95

Okla-Group 3, northern shpt, bulk
- Gasoline, 89 oct reg ... 12-12.25
- Kerosine ... 10-10.5
- Heating oil, No. 2 ... 9-9.375
- **Fuel oil, No. 6** ... **$1.75↓-2.05**

Chicago, bulk
- Gasoline, 91 oct reg ... 13.25-13.8
- Heating oil, No. 2 ... 9.5-10.65
- Heating oil, No. 6 high sulfur ... 8.1-8.2

Los Angeles, rack
- Gasoline, 88 oct reg ... 13.6
- Diesel fuel, PS 200 ... 10-11.25
- Light fuel, PS 300 ... $3.40-3.65
- Heavy fuel, PS 400 ... $2.85-3.05

Natural Gasoline, Grade 26-70
- FOB Group 3 ... 4
- FOB Breckenridge, Tex. ... 3.5

LP-Gas
- Propane, Oklahoma (Group 3) ... 4-5

Penna Lubes
- Bright stock, 25 p.t. ... 27
- 200 vis. neutral, 25 p.t. ... 25

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i. ... 25.5-26.5
- Neutral, solvent, 200-210 vis. ... 21.25-22.25

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i. ... 26.5
- Neutral, solvent, 200 vis. ... 23

Eastern Hemisphere

Singapore (Pulau Bukom), cargoes
- Avgas, grade 100/130 ... 18.625
- Gasoline, 79 oct research ... 10.5
- Kerosine ... 10.375
- Gas oil, 48 d. i. minimum ... 10.375

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, 36.0-36.9 ... 3.07
- North Dakota, 36.0-36.9 ... 3.07
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9 ... 3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9 ... 3.07-3.22
  - West Texas, sweet, 36.0-36.9 ... 3.07
  - West Texas, N. M., inter., 36.0-36.9 ... 3.00
  - West Texas, N. M., sour, 32.0-32.9 ... 2.86
  - East Texas, flat ... 3.25
  - Mirando, 28.0-28.9 ... 3.31
- Illinois Basin, flat ... 3.15
- Pennsylvania Grade, Bradford dist. flat ... 4.65
- California Signal Hill, 21.0-21.9 ... 2.93†
- North Louisiana-Arkansas, 36.0-36.9 ... 3.02
- Wyoming sweet, 36.0-36.9 ... 3.00
- Wyoming sour, 32.0-32.9 ... 2.71

Canada (flat prices, at the well)
- Acheson-Stony Plain (Alta.) ... 2.68
- Leduc-Woodbend (Alta.) ... 2.74
- Redwater (Alta.) ... 2.63
- Daly (Man.) ... 2.46
- Smiley (Sask.) ... 2.40

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo, 48.0-48.9, Tucupido ... 3.75
- San Joaquin, 41.0-41.9, Puerto la Cruz ... 3.34
- Oficina, 35.0-35.9, Puerto la Cruz ... 3.05
- Tia Juana, Medium, 26.0-26.9, Amuay ... 2.55
- Bachaquero, flat, Amuay, Las Piedras ... 2.23
- Tarra, 38.0-38.9, San Lorenzo ... 3.08
- Lagunillas Heavy, flat, Amuay, Cardon ... 2.38

†*Differential per deg. of grav. varies.*

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura ... 2.08
- Safaniya, 27.0-27.9, Ras Tanura ... 1.79
- Iran, 34.0-34.9, Bandar Mashur ... 2.04
- Iran, 34.0-34.9, Abadan ... 1.99
- Iraq, 35.0-35.9, Fao ... 1.98
- Kuwait, 31.0-31.9, Mina-al-Ahmadi ... 1.85
- Qatar, 41.0-41.9, Umm Said ... 2.23

Middle East, Eastern Mediterranean
- Arabian, 36.0-36.9, Sidon ... 2.59
- Iraq, 36.0-36.9, Tripoli, Banias ... 2.59

Far East, Cargoes, FOB Lutong, Sarawak
- Seria Light, 37-38 ... 2.75

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- U.S. Gulf-New York, clean ... (USMC —35%) $1.85
- U.S. Gulf-New York, dirty ... (USMC —35%) $1.85
- NWI-USNH, dirty ... (USMC —55%) $1.22
- NWI-UK/Cont., dirty ... (Scale —30%) 22/9*
- **Pers. G.-UK/Cont., dirty (Scale —52½%) 29/-*↓**
- Persian Gulf-USNH, dirty ... (USMC —50%) $6.35

**Sterling*

DEPT/Personals

W. J. WILKINS, pipe line coordinator for Gulf Oil Corp. since 1950, will head Laurel Pipe Line Co., Pittsburgh company formed to build and operate an oil products line between the Philadelphia and Cleveland districts. Gulf Oil, Sinclair Pipe Line Co., and The Texas Co. own an interest in Laurel. Other new officers are **R. D. Jackson, Jr.,** vice-president and secretary; **M. W. Ramsey,** vice-president; **C. C. Johns,** assistant secretary; **D. M. Hughes,** assistant secretary; and **Peter Affeld,** assistant treasurer. Members of the board include Wilkins, three directors representing Gulf Oil, **J. L. Irvin,** Jackson, and Ramsey; three representing Sinclair, **G. H. Giles, K. T. Feldman,** and **D. S. Purnell;** and two directors from Texaco, **F. M. Dawson,** and **J. W. Emison.**

W. J. Wilkins

H. D. Moore

H. D. MOORE is a new vice-president of Sinclair Oil Corp., New York. He will be executive assistant to the executive vice-president for operations. His duties will include coordination of refining, transportation, and production activities of interests newly acquired by Sinclair. Moore has been assistant general manager of wholesale sales for Sinclair Refining.

ALEXANDER B. CLARKE will manage the Akron (Ohio) sales division of Standard Oil Co. (Ohio), succeeding the late **Elmer E. Koenig.** He was formerly chief of Sohio's sales technical service.

D. V. KITLEY is the new superintendent of production for the Midland (Tex.) district of Ohio Oil Co. He was formerly assistant superintendent, and has been acting superintendent for the past several months. Kitley succeeds **H. J. Brunt,** who recently became assistant superintendent of the Casper (Wyo.) division's production department.

JOHN B. KAVANAUGH, Oklahoma City, has been transferred to Bismarck, N. D. as district landman for Sinclair Oil & Gas Co. In an exchange of jobs, **Rex B. Williams,** formerly at Bismarck, moves to Oklahoma City as district landman.

WILSHIRE OIL CO. OF CALIFORNIA has streamlined its marketing operations to keep pace with increasing sales volume. Refinery sales, a newly created operation, has been established to handle all offshore sales, refinery surpluses, governmental sales, industrial fuel oil and bunker sales, and inter-company sales. **Roy W. Waer** and **Paul E. Wittenberg** are new account supervisors. **Jack Cummins** has been named to the newly created post of manager of asphalt sales. **Michael E. Walsh, Jr.,** will manage direct and wholesale sales; **Richard Marshall** replaces him as supervisor of wholesale sales. **S. O. Everley** will manage crude acquisition and exchange. He was formerly assistant to the general manager of marketing.

JAMES P. FORAKER, former district exploration superintendent for Sohio Petroleum Co. at Wichita, Kan., has resigned to become an independent in that city. Sohio is closing its Wichita district land and exploration office and moving the department to Oklahoma City. The production department under superintendent **D. W. Smith** will remain in Wichita.

RICHARD T. PETERSON, ROBERT R. RIGGS, and **RALPH J. WELING** have joined the refinery technology division of Ethyl Corp.'s Detroit research laboratories. Peterson has a B.S. degree in chemistry; Riggs, both a B.S. degree in chemistry and an M.S. degree in refinery engineering; and Weling, a B.S. degree in chemical engineering.

CLIFF NOLTE has resigned as exploration manager for Sterling Drilling Co. to open a consulting geologist office in Denver. He will continue as a geological consultant for Sterling.

LOWELL M. PUCKETT has been appointed Colorado state supervisor for the Bureau of Land Management, in Denver. He succeeds **Max Caplan,** who has transferred to the bureau's Washington office. Puckett was formerly a state supervisor for the Wyoming bureau.

KEITH W. BLINN is the new associate general counsel for Continental Oil Co., Houston. He succeeds **R. O. Wilson,** who has transferred to New York as counsel for Constock Liquid Methane Corp., a Conoco affiliate. Blinn was formerly an attorney with the company's legal staff.

K. W. Blinn

J. E. Hendricks

JESSE E. HENDRICKS is to be manager of operations for Coastal States Gas Producing Co., Corpus Christi. For the past 9½ years, he has managed the gas, gasoline, and refining department of H. L. Hunt, in Dallas.

J. M. (Jack) REED, former district exploration superintendent for Pan American Petroleum Corp., has opened petroleum consulting offices in Lubbock, Tex. He will specialize on regional geology of the Palo Duro and Anadarko basins.

J. C. Donnell II

R. F. Windfohr

JAMES C. DONNELL II and **ROBERT F. WINDFOHR** are to receive the Texas Mid-Continent Oil & Gas Assn.'s distinguished service award. A top award in the petroleum industry, it goes to an independent producer and a major company executive for their outstanding contributions to development of the oil and gas industry. Windfohr is a Ft. Worth independent producer; Donnell, president of Ohio Oil Co.

O. R. HILBURN has been named accountant for the Canadian division of Pan American Petroleum Corp., in Calgary. **J. R. Carter** succeeds Hilburn as assistant division accountant at Oklahoma City. **M. J. Flippo** is the new accounting supervisor; and **M. E. Price** leasehold and division order supervisor.

LYON TERRY, former vice-president of The Chase Manhattan Bank, has joined Lehman Bros., New York investment bankers. He had been with Chase Manhattan since 1936, when he joined the petroleum department. Terry retired from the bank this past Sept. 30. He is a member of the American Institute of Mining, Metallurgical Petroleum Engineers; American Assn. of Petroleum Geologists; American Petroleum Institute; American Gas Assn.; and the Independent Natural Gas Assn. of America.

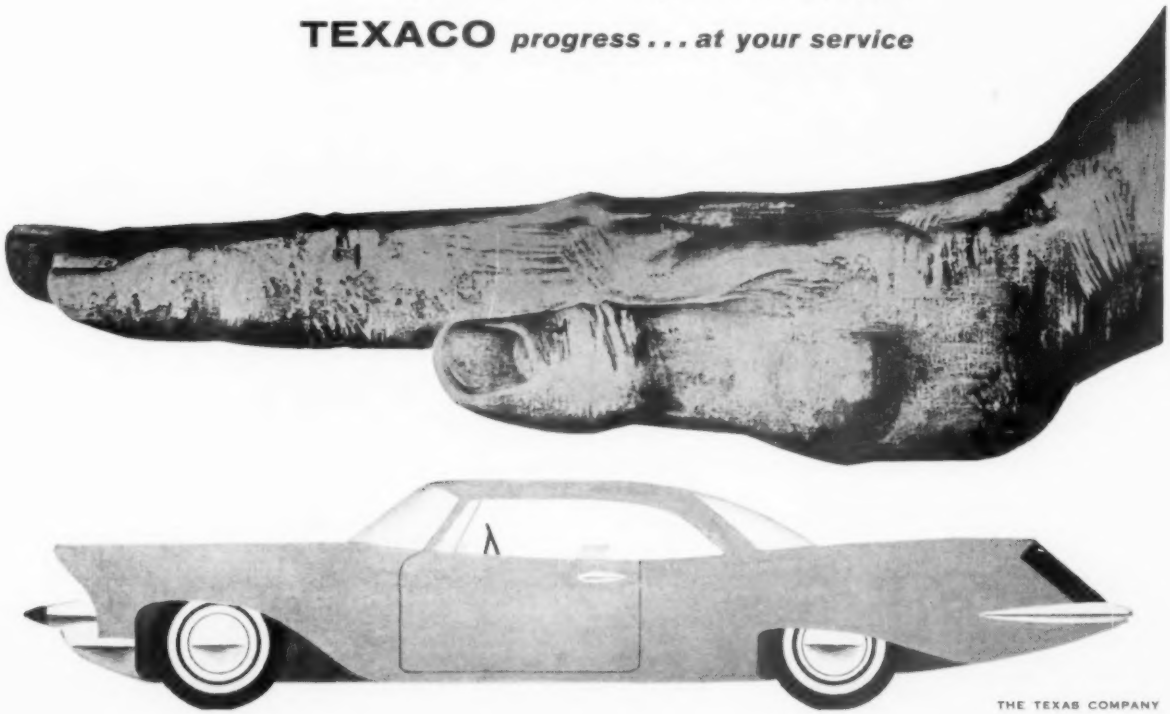
RICHARD H. FINDLEY has been promoted to assistant manager, head office operations department, of Shell Oil Co.'s Martinez (Calif.) refinery. He is succeeded as manager-cracking by **Henry Eichner;** and **Thomas E. Innocenzi** becomes manager-distilling, replacing Eichner.

W. ROY STOCKTON has established offices in Tulsa as a consulting engineer. He was formerly with Service Gas Products Co., and with Warren Petroleum Corp.

W. E. (Bill) SNELL and **GROVER C. COLWELL** have been elected vice-president of Parker Drilling Co. Snell also becomes a director; Colwell has been on the board since 1954. Snell has been a Parker representative in West Texas and New Mexico for 20 years, and is now in

LOW DOWN . . . The low, sleek lines of the modern American automobile are made possible by an ingenious engineering achievement called the hypoid gear. It drives the rear wheels, but because it meshes *below* their centers, engineers are able to reduce an automobile's height. Lubricating the hypoid gear posed a tough, complex problem . . . a problem eventually solved by the combined research skill of the automobile and petroleum industries. Texaco scientists pioneered in developing a rugged petroleum lubricant for this special purpose . . . another evidence of the cooperation and resourcefulness that has made Texaco research a valuable partner of modern industry in its march of progress.

TEXACO ***progress . . . at your service***



THE TEXAS COMPANY

charge of the Midland office. Colwell, with Parker since 1946, was company representative in Ft. Worth until 1954. He has been in the Tulsa headquarters office since then.

JAMES R. RIGGS will manage systems and procedures for Kerr-McGee Oil Industries, Inc., Oklahoma City. He formerly was assistant supervisor for the general accounting department of Standard Oil Co. of Indiana.

J. R. Riggs

L. F. Elkins

L. F. ELKINS will manage production research, a newly established unit of the production department at Sohio Petroleum Co., Oklahoma City. This research unit will work on discovering improved techniques of finding and producing oil and gas. Elkins will continue to serve as technical adviser to **R. W. Edmund,** assistant general manager. Others named to the new research unit include **John Bemrose,** senior research geophysicist; **Lynn Jacobsen,** senior research geologist; **J. E. Berryman,** senior research engineer; **R. J. McIntyre,** research mathematician; and **T. L. Irby,** research engineer.

ELSTER A. SMITH will manage both the gas supply department of Lone Star Gas Co., and the exploration and gas supply division of Lone Star Producing Co., Dallas. He succeeds the late **J. Paul Rogers.** Smith has been assistant manager of the gas supply department since 1954.

WILLIAM H. HENDRICKSON will manage Sun Oil Co.'s Ft. Wayne (Ind.) sales district, succeeding **Douglas H. Carnegie.** Carnegie's new appointment will be announced shortly. Hendrickson formerly managed the company's Reading (Pa.) district.

ROBERT C. HAGENS has joined Coloma Oil & Gas Co., Corpus Christi, as drilling and production superintendent. He recently resigned as production superintendent of American Petrofina, Inc. Coloma Oil is a new company being organized by **William G. Gill.**

FRED M. BUTLER has been elected a director of Cities Service Oil Co. (Del.) Butler is manager of the industrial relations division, Bartlesville, and has been in industrial and personnel relations work for the company since 1930.

J. C. MAGNER, assistant vice-president of Rowan Drilling Co., Ft. Worth, is the newly elected chairman of the Ft. Worth-Dallas regional chapter of the American Assn. of Oilwell Drilling Contractors. Other officers elected are **C. I. Holliman,** president of Holliman Drilling Co., Dallas, vice-chairman; and **John W. Rhea, Jr.,** vice-president of Southeastern Drilling Corp., Dallas, secretary-treasurer.

KEITH GOTT has joined the Russell Maguire interests as assistant chief engineer, in Dallas. He has been chief engineer for MPS Production Co., Houston.

UNION OIL CO. OF CALIFORNIA has named three superintendents to head its newly realigned Pacific Coast field divisions. They are **J. T. Ledbetter,** southern division; **C. E. Smith,** coast division; and **J. L. Stair,** valley division. **John R. Fraser,** now valley division superintendent, will become assistant manager of natural gas and gasoline operations. **R. G. Smith** and **R. T. Wheeler** will be assigned to secondary recovery projects. In the field engineering department, **C. F. Bowden** will be chief petroleum engineer, and **A. F. Woodward** chief exploitation engineer. **V. S. Moyer, F. R. Wade,** and **C. A. Steiner** become division engineers for the southern, coast, and valley divisions, respectively.

HERBERT F. LINDSAY has been named manager of the newly established electronic computer department of Tidewater Oil Co., San Francisco. Lindsay previously headed a team of researchers and analysts formed last year to develop a companywide program for operations research and electronic data processing. Key personnel named to assist Lindsay in the new department are **Dr. John W. Bishop,** senior operations analyst; **Harold J. Maddock,** operations analyst; **Justin B. Murrish,** electronic data processing analyst; and **Dr. Werner W. Leutert,** mathematician.

J. C. LANCASTER, Atlantic Refining Co., is the new president of the Wyoming Oil Scouts Assn. in Casper. Other officers are **Gene Clarady,** Amerada Petroleum Corp., vice-president; and **Rick Merback,** Mobil Producing Co., secretary-treasurer. The executive committee is composed of **Pat Sullivan,** Sun Oil Co.; **Ken Stanolind,** Sohio Petroleum Co.; and **Fred Ryan,** Superior Oil Co.

HERBERT C. OTIS, SR., board chairman of Otis Engineering Corp., Dallas, will be presented with the John Franklin Carll award by the Society of Petroleum Engineers of AIME. The newly instituted award is given in recognition of "distinguished achievement in, or contributions to, petroleum engineering." The Society's Cedric K. Ferguson medal will be awarded to **W. O. Brown,** Humble Oil & Refining Co. engineer at Houston. This annual award goes to the author of the best technical paper prepared by a society member under 33 years of age.

F. J. DOSTALER has been made assistant marketing operations manager of International Petroleum Co., Ltd., in Peru. He has worked for various International subsidiaries in South America. Dostaler has spent the past 10 years in Colombia, where he was, until recently, district manager of Esso Colombiana S. A., in Bogota. The company has appointed **William A. Reaman** to manage the Cartagena refinery in Colombia. He replaces **H. Curtis Carroll,** who has retired after 28 years' service. Reaman has worked for the company in Coral Gables, Fla., and in Talara, Peru, where he was refinery superintendent. In Talara, **Taylor E. Little** becomes employee relations department head. He is transferring from company headquarters in Coral Gables where he has been employment supervisor. Little replaces **W. E. Moore,** who is moving to El Alto as administrative superintendent. In Colombia, **David H. Mortlock** is the new economics advisor to the executive representative's office at Bogota. He was formerly assistant manager of the manufacturing and oil supply department of Arabian American Oil Co. **Michael Schweizer** will take over as producing accounting advisor in the comptroller's department at the Coral Gables executive office. **Lyle A. MacGregor,** accounting department head of Talara operations, succeeds him as accounting department manager in Peru. **Donald J. Whetham,** producing and pipeline accounting advisor in Coral Gables, joins MacGregor as assistant manager of the accounting department.

BILL J. LANGFORD is to be the new exploitation and reservoir engineer for Heritage Petroleum Corp., Dallas. He was formerly associated with Shell Oil Co., in Farmington, N. Mex.

CARL G. MORRISON has been elected a director of Esso Standard (Cuba) Inc. He will continue to serve as head of the manufacturing department of Esso Standard Oil, S. A., in Havana.

CHARLES NORTON, president of Norton Drilling Co., is the newly elected chairman of the New Orleans chapter of the American Assn. of Oilwell Drilling Contractors. Other new officers are **Marshall Smith, Jr.,** president of Continental Drilling Co., vice-chairman; and **Joseph M. Rault, Jr.,** president of Continental Shelf Drilling Corp., secretary-treasurer.

JOSEPH J. LAWNICK has joined American Petrofina, Inc., Corpus Christi, as drilling and production superintendent. He recently resigned as assistant chief petroleum engineer of La Gloria Oil & gas Co.

CLYDE SHANNON is the new president of the Alamo National Bank of San Antonio.

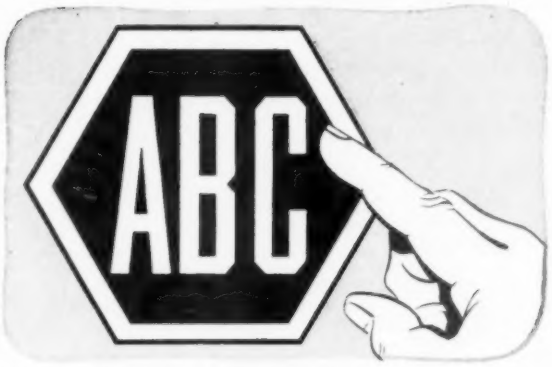
A. D. TURQUETTE has opened a consulting office in Denver specializing in geological and engineering services in the Rock Mountain area. He was the former president of TCT Corp., Denver.

D. N. CANFIELD becomes division landman for El Paso Natural Gas Co., at Farmington, N. M. He was formerly assistant manager of Pacific Northwest Pipeline Corp.'s land department in Salt Lake City.

Who's Minding The Store?

. . . in the magazine publishing business, it's

The Audit Bureau of Circulations (ABC) is a cooperative organization that sets standards of good business conduct for its publisher members. Twice each year ABC auditors carefully scrutinize the entire circulation structure and operation of every member magazine. In a very real sense, therefore, they are "minding the store" — making sure that no false or misleading claims are made regarding the size or composition of a magazine's audience.



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DEPT/Service & Equipment Companies

CARL H. VAUPEL is the new vice-president and general manager of Aldrich Pump Co., Allentown (Pa.) manufacturer of pumps and hydraulic equipment. He succeeds **G. Donald Ruhe,** who is retiring. Vaupel was formerly resident manager of Cooper-Bessemer Corp., in Grove City, Pa.

C. C. SIMMONS is the new director of sales and service for both Franks Division, Cabot Shops, Inc., and for Cabot Shops, Inc., itself. He has moved to Pampa, Tex., to assume his duties in charge of sales for Franks' well servicing units and drilling rigs, and Cabot pumping units. Simmons has been works manager of the Franks Division in Tulsa, in charge of the shop, engineering, and service departments.

VERNON C. WELSH is the new sales representative in Wynnewood, Pa., and **WILBUR W. LINTS** the sales-service representative in Erie, Pa., for American Meter Co. Both Welsh, a 20-year man, and Lints, an 18-year man with the company, have recently completed a six-months sales training course at American Meter's Erie plant.

LARRY D. BARNETT is the new treating engineer for BrakeSol, Inc., in Edmonton, Alta. He will consult on and set up paraffin treating programs designed for the Canadian oil fields. He was associated with United Testers before joining BrakeSol.

RICHARD C. KERR has accepted the position of consulting engineer to Union Industrielle Africaine, of Algiers and Paris, and to Transports Sahariens, Algiers, and their associated American company, Inter-Equipment Co., New York. He will also continue as consulting engineer with Arabian American Oil Co. UIA is engaged in the distribution and servicing of oil drilling and transport equipment. TRAS is a contractor for off-road oil field transportation in the Sahara.

A. D. FOOT is the new assistant director of purchases for Allis-Chalmers Mfg. Co., succeeding **C. H. Norton,** who has retired. He will continue in his present post as purchasing agent. In the company's industrial equipment division, **Robert L. Halsted** becomes general manager succeeding **P. R. Bauer.** Bauer was recently named managing director of Allis-Chalmers International, a new operating division. **Edward H. Baxa,** engineer in charge of pyro-processing machinery, succeeds Halsted as manager of the processing machinery department. The international division has made seven personnel appointments covering its engineering products. They are **Warren J. Holmes,** manager of sales; **J. C. Warner,** territorial sales manager, Middle and East Asia, and Oceania; **D. W. Arendt,** territorial sales manager, Africa, Europe, and Near East; **Ladis Pinilla,** regional sales supervisor, South America; **George D. Sherriffs,** regional sales supervisor, Mexico, Central America, and Caribbean area; **Juan B. De La Torre,** engineer-in-charge, power and electrical project sales; and **Ralph W. Klug,** assistant to associate director of sales.

JAMES H. WYRES, former manager of the West Coast sales district in Los Angeles for the W-S Fittings division of H. K. Porter Co., has been named sales manager of the division, in Roselle, N. J.

C. W. NOFSINGER CO., petroleum and chemical engineers, is moving to a new office in the Country Club district near the famed plaza in Kansas City, Mo. The new two-level air-conditioned building will eventually provide 10,000 sq. ft. of office space.

JOHN RADOS is president of the newly formed Harco Engineering Co., in Los Angeles. The new company will offer a complete engineering service for chemical and petroleum plants. Other administrative officers of the company are **R. G. Rados,** vice-president; **V. J. Bacica,** secretary-treasurer; **U. W. Hird,** general manager; **J. A. Botich,** assistant manager and chief engineer; **L. A. Bell,** assistant manager of production; and **A. W. Wall,** assistant manager of coordination and estimating. President of Harbor Boat Building Co., in Los Angeles.

CHRISTENSEN DIAMOND PRODUCTS CO. and its South American affiliate has appointed Oilfield Sales & Service S. A. as its representative in Venezuela. The company will handle the sale, service, and rental of Christensen diamond coring and drilling equipment from offices and warehouse facilities in Anaco, Maracaibo, and Tia Juana.

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GENE FLORIAN will head the new foreign sales and service office in Paris of Electro-Technical Labs, Houston division of Mandrel industries, Inc. Florian, former Mandrel production manager, will be assisted by two American sales engineers, **Les Jasper** and **George Karamberis**, both formerly design engineers at Electro-Technical Labs. The new office will serve the European geophysical industry and will specialize in oil exploration problems.

J. C. OGLESBEE formerly with the Farmington (N. M.) office, will manage the new division office in Williston, N. D., for Hillmac Division of American Coldset Corp. Other new assignments include **Orville S. Jackson** as sales engineer and contact man in Farmington; and **James Wesley McCoy**, as coring engineer in Kimball, Neb. In Hobbs, N. M., **Charles Crawford**, formerly district manager in South Texas for Hillmac, has been advanced to assistant manager. He will work with **Robert Sides**, Hobbs distirct manager, on sales, operations, and engineering.

DONALD G. DAVIS will be sales engineer in Farmington, N. M., of the Paradox-San Juan basins area for Schlumberger Well Surveying Co. He will be replaced as senior sales engineer in the Denver Julesburg Basin by **M. Rex Curtis**, now sales engineer at Fort. Morgan, Colo.

MARK T. GILKISON will manage the industrial sales division for Gates Rubber Co., Denver. He succeeds **L. L. Carroll**, who is taking over sales duties for Gates on the West Coast. Gilkison has been assistant manager of the division for the past eight years.

BILL BAYLESS is the new Odessa (Tex.) branch manager for Sivalls Tanks, Inc. He succeeds **Jack Gray**, who has resigned to join Eaton Metal Products Co. in Denver as division manager of special products. Bayless was formerly city sales representative in Midland, Tex.

DR. ALEX G. OBLAD has been elected vice-president in charge of research and development activities of M. W. Kellogg Co. He formerly held a similar position for Houdry Process Corp., and, in addition, was a director at Houdry.

SQUARE D CO. has completed a 31,000-sq. ft. electrical equipment assembly plant in Atlanta, Ga. The company manufactures electrical distribution and control equipment.

CONTINENTAL DIAMOND FIBRE OF CANADA, LTD., is the new name of Diamond State Fibre Co. of Canada, Ltd. The name change will permit closer identity with Continental-Diamond Fibre Corp., Newark, Del., a subsidary of Budd Co. The Delaware company manufactures vulcanized fibre and plastic laminates, and a wide range of products for the electrical insulation and electronics industries.

FRED RIPPETOE is moving to Ft. Worth as salesman covering the Ft. Worth-Dallas area for Johnston Testers, Inc. Rippetoe, with the company since 1950, was transferred to the sales department in Abilene in 1955, covering the North Texas area.

F. Rippetoe

A. R. Knerler

A. R. KNERLER has been added to the staff of Jones & Laughlin Supply Division in Tulsa as sales promotion-public relations supervisor. He has been a member of Jones & Laughlin Steel Corp.'s advertising department in Pittsburgh for the past 10 years.

NOMADS, Los Angeles chapter, entertained a group of foreign guests at a recent meeting held there. They are (seated, left to right) **Jerome H. Riewer**, Baker Oil Tools, Venezuela; **Elmer E. Jones**, Shell Oil Co., Venezuela; **"Clipper" Smith**, guest speaker; **Frank R. Wilmer**, Shell Oil, Venezuela; and **J. B. Aquino**, Formac, Brazil; (standing, left to right) **Ralph C. Charlesworth**, Oil Well Engineering Co., England; **B. L. Coker**, Mosul Petroleum Co., Iraq; **H. V. Hale**, Gulf Oil Corp.; Mozambique; **Simon Stein**, Petrobras, Brazil; **Francisco de C. Nogueira**, Petrobras, Brazil; and **Nick Rizzo**, S. H. P., Italy.

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SHOWING THE OWNERSHIP MANAGEMENT, AND CIRCULATION

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5. The average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the 12 months preceding the date shown above was 30,745.

McGRAW-HILL PUBLISHING COMPANY, INC.
By John J. Cooke, Secretary

Sworn to and subscribed before me this 3rd day of September, 1957.

[SEAL] JANET A. HARTWICK.
(My Commission expires March 30, 1959)

Research Could Aid Contractors

DRILLING CONTRACTORS HAVE THE REPUTATION of being among the most rugged entrepreneurs in business. But even the strongest are finding that they are having to run harder than ever just to stand still. And some, running as hard as they can, fall behind and have to stack their rigs.

Just last week, Gene Reid Drilling, Inc., one of the oldest and largest contractors in California's San Joaquin Valley, said it would liquidate its assets and dissolve. Its decision, the company said, was based on the present "general nature" of contract drilling. Said the company, "contract income under present bidding does not provide the corporation with a satisfactory return, considering both variable and fixed costs."

Many of the still-successful contractors now feel they have just about reached the saturation point on improving efficiency with present equipment, as the special report starting on page 43 states.

THE FUTURE SUCCESS of drilling contractors depends upon their own efforts to develop new equipment that will bring even greater efficiency in their operations. Contractors are service firms, and they will exist only as long as they can perform the service of drilling at lower costs than can the producers themselves.

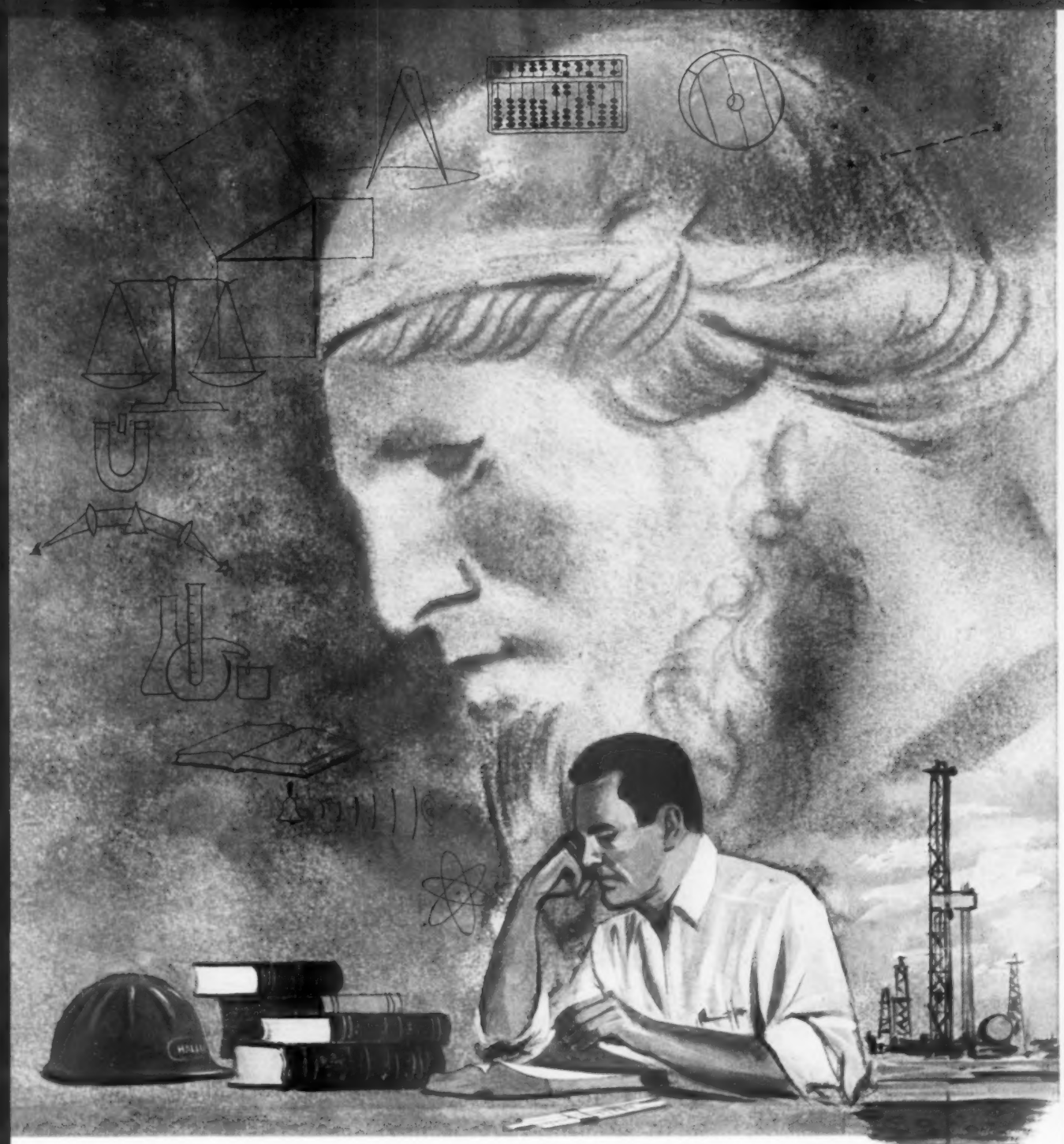
The trend in the U.S. is toward fewer, smaller, and deeper oil discoveries. And such a trend will put even greater emphasis on drilling holes faster and more efficiently.

Drilling contractors so far have been unable to spend much effort on research toward the development of new equipment. While many contractors have made great strides in improving the efficiency of crews and drilling techniques, the necessary research of new tools has been left up to the equipment companies and the larger producers. And the latter, of course, are both customers and competitors of the drilling contractors.

THE PROFITS GENERATED by each individual contractor alone aren't sufficient to support the necessary research for major new equipment. But collectively, drilling contractors should be able to supply the funds. A start has been made on a research program through the American Assn. of Oilwell Drilling Contractors.

Research moves slowly and is necessarily costly. It may be a long time before the association's efforts result in a major new development. It can only succeed if it has the support of each drilling contractor.

But unless it succeeds, contractors will be hard pressed to find customers among producers, some of whom are themselves working hard to find less expensive drilling equipment and techniques.



knowledge

Ever since the dawn of civilization, trails of progress have been blazed by men of knowledge. The path of petroleum is no exception. Built by the step-by-step accumulation of knowledge, the path of oil leads from deep in the earth's crust to the world above, providing energy for the needs of mankind.

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